



VOL. 45, No. 11

NOVEMBER 1977

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COVER PHOTO

Les Jenkins VK3ZBJ, a well known amateur in VHF and UHF circles, proudly displays some of his home built equipment. Les is also very active on ATV with equipment capable of transmitting in the 432, 576 and 1296 MHz bands.

Photo by Reg Goudge

HAM

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HANIMEX AM/CB/FM SOLID STATE PORTABLE RADIO Model 2818

OWNER'S GUIDE — Operating Instructions.

SPECIFICATIONS:

Semiconductor Complement:
22 Solid State Devices (11 transistors, 11 diodes).

Frequency Range:

AM/FM 1600 kHz, CB channel 1-40, FM 88-108 MHz.

Intermediate Frequency:

AM/CB 455 kHz, FM 10.7 MHz.

Output Power:

300 mW Maximum, 10% Distortion 200 mW.

Speaker:

3" 8 ohm Dynamic.

Power Source:

Battery 5V "A-A" size.

Antenna:

AM Ferrite Bar Antenna, CB/FM Rod Ant.

Dimensions:

7" Height x 3.5" Width x 1 1/2" Depth.

Weight:

1 lb. (without Battery).

\$22.50 — Postage \$1.50

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THE RADIO FOR WORLD-WIDE LISTENING
AT ITS BEST — 0.5-29.9 MHz COVERAGE
SYNTHESIZED COMMUNICATION RECEIVER



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\$328

E.E.I. SOLID STATE CAR RADIO

MW BAND

PUSH-BUTTON TUNING

SPECIFICATIONS:

Power Supply: 12 V DC
Receiving Frequency: MW 520KC (500M) — 1640KC (183M)

Intermediate Frequency: 455KC

Audio Output: 4.5W

Transistors: 8, diode 4

Speaker: 5" Permanent Dynamic 4 ohm

Sensitivity: Less than 20 uV at 20 N/S

Selectivity: More than 25 dB at +10 kHz

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A.G.C.: More than 45 dB at 1,000 kHz

IF Rejection: More than 40 dB at 800 kHz

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Cabinet Dimension: 1-7/8" (H) x 6-1/5" (W) x 4-1/8" (D)

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MODEL OL64 D/P MULTI-METER

Very ruggedly constructed this model is particularly suitable for work shops. It features special scales for measurement of capacitance and inductance. Diode protected movement.

SPECIFICATIONS: 20,000 ohm/volt AC, DC volts — 0.25; 1; 2.5V; 10; 50; 250; 1,000; 5,000. AC volts — 10; 50; 250; 1,000. DC amps: 50 uA; 1 mA; 50 mA; 500 mA; 10 A. Ohms — 4 K ohm; 400 K ohm; 4 M ohm; 40 M ohm. Centre scale — 40 ohm; 4,000 ohm; 40,000 ohm; 400,000 ohm. Decibel: —20 to +62 dB. Dimensions: 6" x 4-1/8" x 2"; 152 x 107 x 51 mm. Inductance — 0/3000H. Carrying case available. Model C \$6.90.

\$32.50 Postage \$2.28



E.E.I. PORTABLE RADIO

AM/AIR VHF

SPECIFICATIONS:

Freq. Range: AM530-1600 kHz, AIR (VHF) 108-174 MHz. **Intermed. Freq.:** AM 455 kHz, FM 10.7 MHz. **Output:** 450 mW max. **Speaker:** 2 1/2" permanent-magnetic dynamic type, 6 ohm. **Power Source:** DC — 1.5V (4 x UM3 Pans) or equivalent. **Semiconductor:** 10 trans, 7 diode. **Dimensions:** 8 1/2" (W) x 4 1/2" (H) x 1-7/8" (D)

\$18.90 — Postage \$1.40

MODEL AS100 D/P MULTIMETER

This meter features double zero diode meter; protection and 3 1/2" full view easy to read 2 colour scale. It is fitted with polarity reversing switch and housed in a strong moulded case with carrying handle.

SPECIFICATION: 1000,000 ohm/volt DC, 10,000 ohm/volt AC, DC Volts: 0.5, 5, 12, 50, 120, 300, 600, 1,200. AC Volts: 5, 30, 120, 300, 600, 1,200. DC Amps: 12 uA, 6 mA, 60 mA, 300 mA, 12A. Ohms: 20, 200, 2k, 20k, 200k, 2M. Ohm Scale: 20 ohm, 2,000 ohm, 20,000 ohm, 200,000 ohm, 2M ohm. Decibel —20 to +57 dB. Dimensions: 7-3/8 x 5-2/8 x 2-3/8 in. Carrying case for model 1 — \$7.90.

Price: \$52.50 — Postage \$2.20.

MODEL NC-310 DE LUXE

1 WATT 3 CHANNEL

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● WITH CALL SYSTEM

● EXTERNAL AERIAL CONNECTION

SPECIFICATIONS, NC-310

Transistors: 13.

Channel Number: 3, 27.24 OMHz Cltz. Band.

Transmitter Frequency Tolerance: $\pm 0.005\%$.

RF Input Power: 1 Watt.

Tone Call Frequency: 2000 Hz.

Receiver type: Superheterodyne.

Receiver Sensitivity: 0.7 uV at 10 dB S/N.

Selectivity: 45 dB at ± 10 kHz.

IF Frequency: 455 kHz.

Audio Output: 500 mW to External Speaker Jack.

Power Supply: 8 UM-3 (penlite battery).

Current Drain: Transmitter: 120-220 mA.

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Price: \$105.00 — Postage \$1.40



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amateur radio

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The Editor reserves the right to edit all material, including letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying any reason.

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QSP — PANDORA'S BOX

The Amateur Service is unique and it is international. It is our duty to retain both.

The definition in the ITU Radio Regulations is included in the Australian Handbook 'for amateurs' and is self-pronged. It is a service of —

self training,
intercommunication, and
technical investigation, etc.

The definition is good but too concise for ease of understanding by the non-amateur. His only view of the service is the intercommunication aspect. To him this is the beginning and end of it. We have had good mileage from this out of emergency situations around the world. But without the other two prongs the definition would fall down.

WARC 79 now has Article 41 included on the Agenda. This Article of 5 clauses details the service requirements for amateur stations (banning of amateur radio, third party, more below 144 MHz, technical qualifications, power, application of the general rules, spirit, identification and amateur satellite operations in shared bands).

A significant number of those who will be attending WARC 79 on behalf of many member countries may not know much about the background, development, history and aims of the amateur service.

Thus, if they are let loose on Article 41, it could happen that they will come up with outrageous, preposterous or positively undesirable or harmful amendments, which could be carried by numerical strength.

For this reason IARU HQ has advised member societies that it is considered in the overall best interests of the service not to take these risks. It is agreed there are some aspects of Article 41 which we all think can be improved, but by and large we have got along reasonably well on a global basis with what is there now.

We can follow our varied interests without too much hindrance. We can keep up with the state of the art within those guidelines. We can continue to retain our uniqueness as a radio service.

I hope this provides you with the latest background to the varied problems of WARC 79.

DAVID WARDLAW, Federal President. ■

WIRELESS INSTITUTE OF AUSTRALIA

Federal President: Dr. D. A. Wardlaw VK3ADW

Federal Council:

VK1 Brig. R. K. Roseblade VK1QJ
VK2 Mr. T. I. Mills VK2ZTM
VK3 Mr. C. K. Meude VK3ZCK
VK4 Mr. N. F. Wilson VK4NP
VK5 Mr. I. J. Hunt VK5QX
VK6 Mr. N. R. Penfold VK6NE
VK7 Mr. P. D. Frith VK7PF

Staff: Mr. P. B. Dodd VK3CIF, Secretary.

Part-time: Col. C. W. Parry, Mrs. J. M. Seddon and Mr. T. Cook (AR advertising).

Executive Office: P.O. Box 150, Toorak, Vic., 3142.
2/517 Toorak Rd., Toorak, Ph. (03) 24 6552.

Divisional information (all broadcasts are on Sundays unless otherwise stated):

ACT:

President — Mr. E. W. Howell VK1TH
Secretary — Mr. D. J. Farquharson VK1ZDF
Broadcasts — 3570 kHz & 146.5 MHz: 10.00Z.

NSW:

President — Mr. T. I. Mills VK2ZTM
Secretary — Mr. I. A. Mackenzie VK2ZIM
Broadcasts — 1825, 3585, 7148 kHz, 28.5, 52.1, 52.525, 144.1, Ch. 8 and other relay stations: 01.00Z. (Also Sunday evenings 09.30Z and Hunter Branch, Mondays 09.30Z on 3570 kHz and ch. 3 and 6).

VIC:

President — Mr. S. T. Clark VK3ASC
Secretary — Mr. J. A. Adcock VK3ACA
Broadcasts — 1825, 3600, 7135 kHz — also on 6m, 2m SSB and 2m Ch. 2 repeater: 00.30Z (Also on Radio 3HA).

QLD:

President — Mr. D. T. Laurie VK4DT
Secretary — Mr. P. Brown VK4PJ
Broadcasts — 1825, 3580, 7146, 14342 kHz: 09.00 EST.

SA:

President — Mr. C. J. Hurst VK5HI
Secretary — Mr. C. M. Pearson VK5PE
Broadcasts — 1820, 3590, 7125, 14175 kHz; 28.5 and 53.1 MHz, 2m (Ch. 8): 09.00 S.A.T.

WA:

President — Mr. R. Greenaway VK6DA
Secretary — Mr. N. R. Penfold VK6NE
Broadcasts — 3500, 7080, 14100, 14175 kHz, 52.565 and 2m (Ch. 2): 01.00Z.

TAS:

President — Mr. R. K. Emmett VK7KK
Secretary — Mr. H. E. Hewens VK7HE
Broadcasts — 3570, 7130 kHz: 09.30 EST.

NT:

President — Mr. Doug Haig VK8JD.
Secretary — Mr. Henry Anderson VK8HA.
Broadcasts — Relay of VK5WI on 3.55 MHz and on 145.5 MHz at 2330Z. Slow wave transmission by VK8HA on 3.55 MHz at 100Z almost every day.

Postal information:

VK1 — P.O. Box 1173, Canberra, 2601
VK2 — 14 Aitchison St., Crows Nest, 2065 (Ph. (02) 43 5795 Tues & Thurs 10.00-14.00h).
VK3 — 412 Brunswick St., Fitzroy, 3065 (Ph. (03) 41 3535 Sat 10.00-12.00h).
VK4 — G.P.O. Box 638, Brisbane, 4001.
VK5 — G.P.O. Box 1234, Adelaide, 5001 — HQ at West Thebarton Rd., Thebarton (Ph. (08) 254 7424).
VK6 — G.P.O. Box N1002, Perth, 6001.
VK7 — P.O. Box 1510, Launceston, 7250.
VK8 — (incl. with VK5), Darwin AR Club, P.O. Box 1418, Darwin, 5794.

Slow wave transmissions — most week-day evenings about 09.30Z onwards around 3550 kHz.

WIANEWS

POSTAL MOTIONS

The three Postal Motions listed in WIANEWS, October AR, were passed by Federal Council and therefore now represent policies of the Institute.

LEGISLATION

For a long time the Institute's representatives have made it known to those concerned that the WIA is actively interested in any impending legislation which affects the amateur service. For example please see WIANEWS in AR for December 1975.

This matter was the subject of talks with Government officers in April and May and culminated in a discussion paper being handed to the Department during June. The paper dealt with definitions, controls over equipment particularly transmitters, and the need for legislation to cover a number of assorted situations.

It was agreed there is little room for debate that the Wireless Telegraphy Act of 1905 requires substantial revision and assumes, as is well known, such a review is imminent. No attempts were made to evaluate the extent of the Commonwealth constitutional powers or to anticipate the many areas of detail requiring attention by reference to other bodies, for example, industry in relation to the control of EMC. The discussion paper did not pretend to set out the policy views of the WIA at that stage except to highlight some major matters of special interest to the amateur service as a whole.

Both the P and T Department and the WIA know that the law relating to the general radio services is under review and both are aware of the changes which have recently occurred or are proposed. It is therefore pointless for either of them to press for a general revision of the Handbook.

50 cm BAND PLAN

At the September meeting of the VHF/UHF Advisory Committee (a Committee of the Executive) a draft band plan for the 50 cm band (576-583 MHz) was discussed and prepared. Now that the P and T Department has given approval in principle for cross-band ATV repeaters (70 to 50 cm bands) it seems desirable to nominate certain frequencies in the 50 cm band so as to minimise interference between different modes.

Details of the draft band plan are to be published shortly in AR for general comment. The proposed video carrier frequency is 579.25 MHz.

MUF FOR VHF OPERATORS

The VHFAC advise in preparation for the Dx season the necessity to clear the calling frequency as soon as a contact has been established and then to QSY higher in frequency (Move Up in Frequency — not down).

MORSE EXAMS

The Federal Education Co-ordinator asks why have CW examinations at all, especially Novice Morse. The reason mainly derives from the ITU regulations which require that all amateurs not exclusively using frequencies above 144 MHz shall prove the ability to send correctly by hand and to receive correctly by ear, texts in Morse code signals. Australia is in derogation, much to her embarrassment internationally, because of setting the 6m band as the lower limit. At WARC 1959 many administrations wanted 1000 MHz as the lower limit.

The big question, raised with the Department, is the spacing format of the Novice Morse exam. The P and T Department has stated that the ITU method of spacing is to be used. The length of the dot governs all the parameters. An analysis of candidates' reactions and additional tests carried out by experts shows that 5 w.p.m. ITU standard Morse is much more difficult to copy than 5 w.p.m. where the characters are sent at a higher speed and the spacings lengthened to compensate. The submission made to the Department in May was based on a carefully documented compilation by Roger Davis, VK4AAR using a microprocessor to generate various CW speeds by sending letters at a constant rate and varying the spacing to double or triple the spacings. There is a distinct brain recognition problem in comprehending the ITU standard CW at the low speed of 5 w.p.m.

He also asks why steps are not being taken to make the Novice licence as easy as possible to attain without necessarily lowering standards in the process.

AMATEUR ADVISORY COMMITTEES

The role of these Committees has been discussed for many years and a review has been in the pipeline as an idea for some time. Certain events during August highlighted the situation already alluded to in the letter of 8th August to the P and T Department, see Sept. AR page 21 Appendix A Part A(9). The Advisory Committee system does assist towards reducing arbitrary decisions by the licensing authority, particularly in the light of the submissions by the WIA relating to third party provisions (see WIANEWS in the same issue).

GOVERNMENT POLICIES

The opening address by Senator J. W. Knight (on behalf of the P and T Minister) at the NCRA's first national convention (CB) in Canberra on 3rd September contains passages of interest to radio amateurs.

In referring to the introduction of CB in Australia he pointed out, it is reported, that the introduction of a (new) radio service is a very complex matter. To preserve the RF spectrum it has always been necessary to carefully restrict radio communication services to meet needs which could be demonstrated as essential and which are generally in accordance with the philosophies of the ITU.

He is reported as saying that another particular concept (apart from vast distances in Australia between cities) of any administration is the possibility of interference caused by transmissions in the HF part of the spectrum — very significant in relation to the introduction of CB.

The Government was anxious that Australian manufacturers should be given an opportunity to compete in the CB market and also believed on technological grounds the advantages of UHF as most suitable. He hoped CB-ers would change to UHF as quickly as possible.

Something still to be resolved was the maintenance of discipline on CB bands and he recommended self-regulation since Government could introduce the necessary legislation but preferred a representative organisation for consultations. He gave notice of Government intentions to change the CB rules and regulations.

There is concern, he said, about advertisements appearing in specialised CB publications advertising the sale and availability of amateur service equipment and power amplifiers. The Minister (P and T) wished it to be made quite clear to everyone concerned that the Government will not stand by and allow pirating activities into other authorised services. Nor will Government stand by and allow power amplifiers designed for another frequency to be sold for and used within the CB service. It is Government's view that strong action should be taken to ensure that other authorised services are protected.

The Government, he went on, is presently preparing a new radiocommunication Act to replace the existing WT Act and expected it would be introduced in the 1978 Autumn session of Parliament. The drafting of the Act is now taking place and it will rectify the faults of the old Act as well as making provision to strengthen Government control over regulating of services. He hoped the UHF CB service will soon commence and referred to a suggestion that Government's decision in relation to the acceptance of the interim HF (CB) service transfers an illegal operator situation of 1977 to 1982. This was not the case, he said. In 1982 operators of HF equipment will only be allowed to continue using that equipment under the auspices of the amateur radio service. Five years was enough time for people to qualify as amateur operators although it might well be that modifications to the existing examination procedures and restrictions will take place during this period. The WIA he said had already made a submission seeking changes which are now being studied.

At this Convention the WIA ACT Division held very preliminary talks with the NCRA and laid on demonstrations of amateur operators and equipment.

1977 CALL BOOK

Some of the call sign listings were poor in print quality but now under investigation are proposals to change our computer records to a commercial company undertaking the entire operation from computer records through to the mailing of AR! If this occurs the computer printouts for future call books hopefully will be an improvement. At the same time it should be possible for call signs to be printed on AR labels. Keep your fingers crossed; negotiations are still at an early stage.

One of the several problems which have emerged is the absence of some call signs from the 1977 listing. This was caused by membership changes occurring during the preparation of the input material as explained in the editorial in the Call Book. Please ask any VK amateur not in the Call Book to write in to the Executive Office if his call sign was issued prior to this year.

QSP

EX-G CLUB

The Secretary of the Ex-G Radio Club, Australian Division, is Steve VK2BA, of 1 Emily Avenue, Clapham, SA 5062. Anyone born in the UK and now living in VK might like to contact Steve for details of membership, nets, bulletins, etc.

KERMADEC ISLAND EXPEDITION

Auckland Branch of NZART plan to activate Kermadec Island from approximately 20-31 October under the call sign of ZL1AA/K. This island counts as a separate country for DXCC purposes. At least five operators, including two YLs, will use all bands 16-10m, both phone and CW. Split frequency operation is proposed with breaks for transmitters. Special attention will be given to weak and QRP stations. Stations calling are requested to do so as only in accordance with the operator's directions and to QRS to 15 w.p.m. on CW.

FRENCH STATIONS ON 160 METRES

For the first time since 1959 several French amateurs have been granted permission to operate 160m for special contests on 1826 kHz only. The mode is A1, power to the PA stage 10W, and maximum time to be obtained before each contest. CST June 1977.

CANADA'S FIRST BLIND-DEAF AMATEUR

Yes, according to Worldradio News for July 1977, Kay Clarke of Ontario has just passed her amateur radio licence exam and has the call VE3KAY despite the double handicap of being both deaf and blind. The basic device used as a receiver is a sort of loud-speaker of special design with a plastic plate in place of the grille, which vibrates in response to the dots and dashes of Morse code coming in on the receiver. She "reads" the code by touching the device with her fingertips and hit 14 w.p.m. in her exam. Kay was helped by many Ontario amateurs, including two blind amateurs VE3KP and VE3EEK.

FREE—DIGITAL SYMPOSIUM

The Institution of Radio and Electronics Engineers is holding a Symposium for Engineering Support Staff on Digital Processors and Analog-Digital Interface Circuits at Clunies-Ross House, Parkville, on Thursday, 31 November, from 08.00 to 17.00h.

QE PREFIX

On 7 June 1977 reported that British amateurs would be permitted to use the special prefix QE from 4th to 12th June in honour of HM the Queen's Silver Jubilee.

EXAM EXEMPTIONS

The P. and T. Department has recently approved exemptions from the AOCIP theory exam for two persons possessing suitable qualifications. These persons possessed Radio Technician Certificate and Broadcast Ops. Certificate respectively. To obtain an exemption, the application must include a detailed analysis of the course syllabus covered, and documented evidence of a satisfactory pass in all subjects. Applications should be forwarded to P. and T. Department Central Office.

VARIOUS

Good news for members. The Federal element in the 1978 subscriptions will remain the same as for 1977, namely AR \$7.20, IARU 30c, and Federal \$7.50, making a total of \$15.00 for each full and associate member. Divisional Councils have been considering ways and means of raising their pro rata amounts towards the expenses of WARC 79 representations.

The Federal President paid an official visit to the SW Zone Convention in Griffith during the first week-end in October and is hoping he can also find time to attend other Conventions including the NT Communications Convention '77 in Darwin on 3/4 December.

Some mention really ought to be made about Youth Radio Services activities in VK2 but this will have to be held over to December for space reasons.

1977 CALL BOOK

By the end of September stocks of the 1977 Call Book were virtually exhausted. Only enough copies remained on hand to meet an occasional request for a single copy. Taking into consideration the increase in size and price compared with the 1975 edition, and the fact that the original 1975 print run was increased by 50 per cent, the result is most encouraging. The defective characters in some places in the call sign list was a computer print-out function over which the Institute had no control. This occurred even though a new ribbon had been requested for the Call Book print-out.

NORTHERN TERRITORY COMMUNICATIONS CONVENTION

On the 3rd and 4th of December the most comprehensive Communications Convention ever will be held in the Northern Territory at the Darwin Community College.

This general convention, open to the public, has been organised by the combined efforts of the two hobby radio factions in Darwin.

Display and lecture material will be presented by the Darwin Community College, Telecom Australia, A.B.C., Government Departments, the Defence Forces, local and interstate business houses and the Amateur and Citizens Radio Organisations.

The community of Darwin, intrastate and interstate visitors will find that aspects, applicable to themselves, will be covered.

Bodies interested in participating by way of displays, lectures or field demonstrations should contact Mr. Doug Tate, State Director of the NCRA, or Mr. Doug Haig, President of the Darwin Amateur Radio Club, on 85 2016.

RFI AND OTHER PROBLEMS

The June 1977 issue of Worldradio contains an article by KRLRP on the formation of the "Personal Communications Foundation" to combat a major legal crisis said to be only the tip of a future iceberg. To quote "Citizens Band and Amateur Radio operators are currently being sued in virtually every State for electrical interference, violations of antenna and tower ordinances and property deed restrictions stemming from their use of transceivers, towers and antennas manufactured and sold by the personal communications industry. State and local communities are enacting specific criminal statutes or are employing existing criminal nuisance and disturbing the peace statutes to subject users to substantial fines and the possibility of imprisonment when neighbours complain of television and radio frequency interference. Local communities in all States have enacted zoning ordinances which either prohibit radio towers and antennas entirely or which limit the height of antennas to as little as six feet above the roof line and which impose size limitations effectively prohibiting antennas longer than a medium sized television antenna. The explosive growth of the CB service in the US and Canada in the 1970s has placed personal communications in essentially the same position as the automobile at the start of the 20th century (local communities promulgating legislation prohibiting cars from city streets as being ugly, noisy machines scaring livestock, emitting unpleasant odours and disturbing the peace)."

ITU MEMBERSHIP

The total membership of the ITU is now 153 consequent upon the admission of the Republic of San Marino. 26 of these countries are in Region 3 and exactly half of these countries do not have an IARU membership society. In fact many of them have no amateur radio at all. Want to know what countries these are? Afghanistan, Bangladesh, China, F.I.J., Indonesia, Iran, Khmer Rep., N. Korea, Laos, Maldives, Neuru, Nepal and Vietnam. Data from IARU RI News, September 1977.

NEW PREFIXES

IARU RI News lists the allocation of two new call sign series—H4A to H4Z to the Solomon Islands and J3A to J3Z to Grenada.

EDITOR'S DESK

By BRUCE BATHOLDS
VK3JUN

AMATEUR RADIO — AUSTRALIA'S WINDOW ON THE WORLD

Next month starts the usual hustle of Christmas and New Year celebrations.

In accordance with the practice over the last couple of years, we will be producing a bumper issue of AR. This year, in an endeavour to attract interested newcomers to the hobby, the December issue will be published in the form of a book.

Its title will be called "Amateur Radio — Australia's Window on the World", and will be available for sale to the general public on the book stalls.

Members of the WIA will be receiving a copy free in lieu of a normal issue of Amateur Radio.

The purchase price will be \$1.35 plus 40c postage.

Copies will also be available in early December from the WIA, PO Box 150, Toorak, Vic. 3142.

Here is an opportunity to buy an ideal Christmas gift for a friend who may be showing an interest in amateur radio as a hobby.

The issue will contain several original articles specially selected for the newcomer, as well as the normal type of articles and Department series.

We would ask that this information be made known as widely as possible.

DIGITAL LOGIC CIRCUITS IN COMMUNICATION

J. Day VK3JF

Many people in amateur circles have played around with digital logic circuits, many also have not. In communication equipment we are seeing more and more digital logic creep in. This may be good, it may be bad, it depends on which side of the fence you sit. For those interested I intend to describe some applications I use in communication equipment and hopefully inspire other people to do the same.

Probably one of the most common applications of digital logic in amateur equipment is the PHASE LOCKED LOOP FREQUENCY SYNTHESIZER. The PLL SYNTHESIZER is becoming more and more commonly used, as our VHF and UHF bands become more crowded, for the generation of large numbers of closely spaced channels.

The PLL synthesizer relies on a basic mathematical equation for its operation.

$$f_c = f_r \times N \quad \text{or} \quad f_r = f_c/N \quad (\text{Eq. 1})$$

Where f_c = carrier or output frequency.
 f_r = reference frequency.
 N = division ratio.

Basically the PLL synthesizer looks like this:

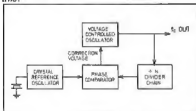


FIG. 1: Fundamental PLL Synthesizer.

The heart of the PLL synthesizer is the phase detector. Two signals are applied to the phase detector. One of these frequencies is the reference frequency. This reference frequency is normally derived from a crystal oscillator or some other stable source. The second signal comes from the source which is required to be controlled. If this signal is lower than the reference frequency, the output of the phase detector will be a continually high voltage. If it is higher, output will be continually low. When the two frequencies are the same, the control output will be pulses corresponding to the phase shift between the two signals thus attempting to bring the two signals precisely into step with each other. The above information applies to most integrated phase detectors and specifically the MC14046 CMOS type from Motorola.

From the output of this phase detector, we drive a voltage controlled oscillator. The oscillator is basically a VFO which is

tuned by using a varicap type diode. A typical circuit of a VCO is shown below.

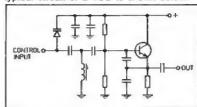


FIG. 2: Basic Voltage Controlled Oscillator.

This oscillator circuit, it can be seen, is almost identical to the conventional Colpitts type VFO, the only difference being the varicap control element. Normally the VCO is fed through a low pass filter so that it will follow a smoothed out version of the control waveform that corrects the frequency.

Thus if we have a crystal controlled reference oscillator, a phase comparator and a VCO we can lock the VCO to precisely the crystal frequency. In a lot of cases though, the required output frequency is different from the reference frequency.

Let us say we want a very stable source of signal at 100 MHz precisely and we have a 1 MHz reference. If we want a signal at 100 MHz we must obviously run the VCO at 100 MHz. How do we control this from a 1 MHz reference? If we divide 100 MHz by 100, what do we have? 1 MHz, how convenient! By comparing this with the 1 MHz reference we can control the 100 MHz and have its stability basically that of the reference. (See Fig. 3).

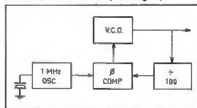


FIG. 3: Phase Locked Multiplier.

How strange, this look precisely like the block diagram of Fig. 1, and it can also be seen that is conforms to Equation 1.

$$f_c = f_r \times N \\ 100 = 1 \times 100 \text{ (MHz)}$$

Now let us complicate things a little. If we replace the crystal reference oscillator with a 1-2 MHz VFO, what happens? If the VFO is set on 1 MHz the VCO frequency will be divided by 100 and the phase detector will lock the VCO to 100 MHz. If the VFO is shifted to 2 MHz the VCO will still be at 100 MHz, when this

is divided by 100, f_c/N to the phase detector will be low, and the phase detector will force the VCO to increase in frequency until the f_c/N component is equal to the new reference frequency of 2 MHz. The VCO will now be at 200 MHz. Thus we now have a well controlled x 100 multiplier. Just one more form of PLL synthesizer.

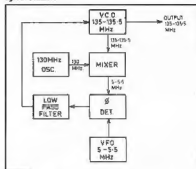


FIG. 4: Phase Locked VFO.

We don't really need to use a frequency divider in a phase locked loop. Instead we can use a mixer chain. Say we wish to build a single conversion tunable receiver to cover 144.000-144.500 MHz, using a 9.000 MHz IF similar to the design presented by Harold Hepburn VK3AFQ.

To do this we must first work out the required injection frequencies. The injection will be between 144.9 and 144.5-9 MHz, or from 135-135.5 MHz. If we choose to use a 5-5.5 MHz VFO we have the opportunity of having a good high stability oscillator, none of whose harmonics fall into either the signal or IF frequency ranges. If we have a crystal oscillator with which to mix the output we can bring the VCO back to 5 MHz. (See Fig. 4.)

Now we have a VFO on 135-135.5 MHz which has the stability of the VFO and crystal heterodyne oscillator combined.

By using the basic phase locked multiplier we can generate a much more complex unit which is what is commonly called the phase locked synthesizer. In this form of system the divide by N counter is made variable. Consider a practical example.

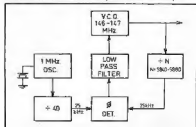


FIG. 5.

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We wish to generate a signal varying from 146-147 MHz in 25 kHz steps. If we have a VCO on 146 MHz and divide it by 5840 we have 25 kHz. If we compare this with a 25 kHz signal we have a phase locked source on 146 MHz. If we make the

divide by N chain divide by numbers between 5840 and 5880 we have 40 channels between 146 and 147 MHz.

ACKNOWLEDGEMENTS

My thanks go to two people who have unwittingly contributed to this series. Mr. Ian

Yandell VK3ZLY, with whom I have been privileged to work on synthesizer type systems, and to Harold Hepburn VK3AFQ, who has suggested several interesting applications of PLL circuitry to communication systems. ■

RTTY RECEPTION ON THE FT101

In his recent article (AR p. 10 July, 1976), Don VK3ADP described a modification of the filter switching of the FT101. I also decided to modify the switching, however I wanted to be able to use the CW filter in the SSB model. This seemingly idiotic feature is just what is needed for RTTY.

Fig. 1 shows the FT101B filter characteristic. In the CW mode reception is achieved with the USB oscillator. The signal is centred in the CW filter's 600 Hz pass-band, thereby producing a beat note of around 800 Hz.

If the LSB oscillator were used, together with the narrow filter, a beat of around 2200 Hz is produced. As the CW filter is wide enough to pass a standard 170 Hz narrow-shift FSK RTTY signal, the tuning can easily be adjusted to give the standard RTTY tones of 2125 and 2295 Hz. As it happens these tones are even the right way around for HF use! Perhaps Yaesu had this in mind—it seems too much of a coincidence to be an accident.

By using the LSB oscillator and the CW filter with the set in the SSB mode trans-

mission of RTTY could be arranged by feeding 2125 and 2295 Hz tones into the speech amplifier. The necessary audio connections can all be made via the rear panel sockets.

The modification needed to achieve this happy state of affairs is extremely simple. With the help of the manual, locate pins 9 and 12 on the socket for the IF board (board number PB1183B). These lines are the narrow and wide filter enable lines respectively. Break the wires connecting to these pins and install a miniature DPDT switch connected as a reversing switch. I placed this on the bottom panel under the microphone socket to avoid altering the front panel. As these are DC switching lines any other convenient position may be used.

In use the switch enables the AM filter to be used in the CW mode (as in the VK3ADP modification) and the CW filter in the other modes. For RTTY only the narrow filter/LSB combination is of use. With a 2125/2295 RTTY TU and tone oscillator, transceiving should be quite simple, although I have not used this set to transmit HF RTTY (for obvious reasons).

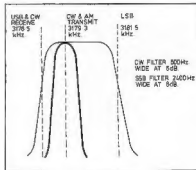


FIG. 1: FT101B Filter Characteristics.

The transceiver should presumably be loaded up as for AM or perhaps a little more heavily. Note that CW loading cannot be used—a 100 per cent duty cycle applied for the length of a RTTY over would liquify the finale!

(The FTdx401, FT570 and FT401 also use the same filter and oscillator frequencies and therefore the principle of the modification also applies.—Ed.) ■

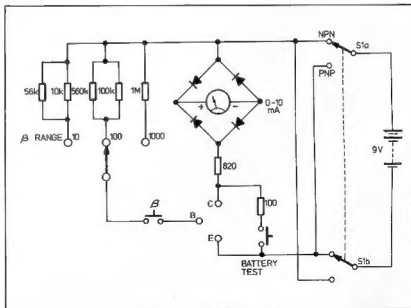
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Ron Cook
VK3AFW.



CQ AERONAUTICAL MOBILE

Bob Cunningham VK3ML,
384 Glenferrie Road, Malvern.

My very first flight ever was made at night from the Essendon aerodrome around 1929. On this occasion the Victorian Division of the WIA was operating experimental aircraft radio in conjunction with the Aero Club and, in fact, had a workshop in the hangars at Essendon. A transmitter was built by members of this group and was made to fit in the front cockpit of the aircraft. It had been decided to advertise a forthcoming radio show in Melbourne by making the words RADIO SHOW with automobile headlamp globes fitted under the lower wing of the aircraft. A flight was to be at night and someone was to describe what Melbourne looked like from one, or perhaps two, thousand feet. Yours truly was the "lucky" one chosen for this task!

Now, consider a 80 h.p. Moth aircraft loaded with two men plus some six car batteries and a radio transmitter. That is one thing. Next consider the Essendon aerodrome in those days. It was a large paddock, encircled with a fence, and perhaps a few hundred yards in diameter. Landing lights did not exist and my pilot, Hughie Hughes, the Aero Club instructor, had chosen a dark starless night for this exciting adventure!

The rules of flying in those days required one to taxi to the extremity of the field so that the longest take-off path was used. Finding the fence was Hughie's first task, which he successfully did with the aid of a torch of about the same brilliance as used by ushers in theatres. With the 60 h.p. engine roaring like a snorting monster we proceeded to take off. Alas, the fence on the opposite side of the 'drome loomed up with the tail skid still on the ground. Hughie throttled back the engine and suggested I should disembark and he would try again without my weight. This he did and found with the aid of some grit and cunning a take off with my extra weight was possible. I am happy to say that the venture was successful. Once up the world was our own. I commenced transmission and told listeners through 3LO what Melbourne looked like at night from the air.

Coming back was another story. There were no illuminated freeways or well lit shopping centres in those days. Street lighting was by shaded 100 watt or maybe 200 watt globes and the Essendon airport

was conspicuous by a black patch of land in a very lightly populated area. However, Hughie found the patch and set the nose down to land. The landing light consisted of a run-down torch which showed up mother earth just ahead of the landing wheels.

To me, that was a big deal! Sweet innocence I call it. Ask me to do the same trip today with 60 horses, two men and six batteries with a run-down torch for navigation? You MUST be joking! Still, it must have been one of the early aeronautical mobile operations in which the WIA played a great part.

Now I have a friend, Geoffrey Cox. He is the son of Harold Cox VK1GU, in Canberra, who pioneered the high frequencies over the Pacific many years ago. Geoff is a pilot at the Victorian Gliding Club at Benalla, some 150 km up the Hume Highway from Melbourne. I was invited to be his guest for a flight some weeks ago. After wearing down some bitter opposition from the XYL and promising to send messages back from Cloud 9 if I should ever reach the New World, I arrived at Benalla with Geoff. This location, by the way, had been an EFTS during the war years and later a migrant centre.

This Club has many members of both sexes and pilot training courses are in continuous operation. The glider to take me aloft had a wing span of some 17 metres and had become a popular two seater after its introduction into Australia from Rumania. Other gliders I saw included single seater competition aircraft having a wing span of some 15 metres. Our machine was a model IS-28.

For good flying conditions one needs atmospheric convections, experienced mainly in the summer. With favourable conditions gliders may stay aloft for hours, and cross country flights of 300 to 500 km are common, whilst beyond 500 km is quite possible. One must have uplifting currents, known as thermals, to achieve such performances. Unfortunately my flight was



Bob VK3ML

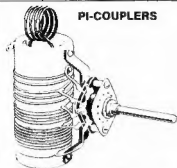
in the winter and because the sport is now so very popular, it was not until late in the afternoon when the thermals had died down that I was treated to a flip of only half an hour. There is not much room in the cockpit of a glider and you certainly do not have friendly hostess treatment! You are well belted in with the aid of a shoe horn, followed by the closing of a plastic canopy overhead. A tow line of some 150 feet is attached to a "tug" aircraft which tows you aloft to some 2-3000 feet, at which altitude the pilot of the glider opts to cast off the rope. It is a great sensation to be pulled gently to the cast off height and then to float alone. We must have flown some ten minutes at 3000 feet at about 50 knots before Geoff put the glider into a gentle dive at about 80 knots to demonstrate the aircraft's flexibility. Whilst all this was going on I extended the whip antenna of my 1 watt two metre transceiver and found I could trigger the repeaters at Wodonga and Bendigo with ease. I also had four simplex channel QSO's on 40 and 50. I thoroughly enjoyed sitting up there with just the whistling of the wind past the canopy and with no motor noise. Once again the world is your own at the base of the clouds and you are seeing countryside at 50 knots which you would not see whilst flashing past in a 500 knot modern airliner.

When the pilot feels he has no further air support he turns straight for home and glides in like a bird making a landing. When you finally come to a stop club members come out to man-handle the glider to other awaiting aspirants.

To me it was a great day and if I am asked if I want another flip in a glider I'll say "Just ask me". No motor is better than 60 horses. ■



Cockpit of glider.



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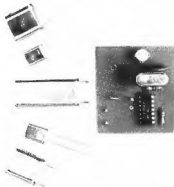
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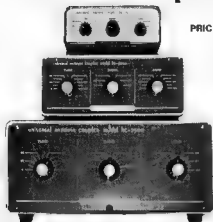
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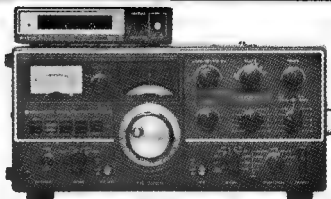
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Over the years there have been a great many designs for DC supplies with good regulation. Most of these have, however, been fairly complex and use discrete components. With the advent of integrated circuit regulators the design of such supplies has been simplified, but many designers have included a great deal of sophistication into their designs, and hence increased the complexity. An example of such a supply was the design in AR of April 1975.

Whilst such supplies, with all their sophistication, have a lot going for them, many people require something a little simpler. The circuit to be described should suit the needs of these people. As may be seen from the measured performance

at the end of this article, there is no common also act as emitter followers. Resistors R5 and R6 are small value resistances which balance the current drawn by the two until each is carrying about 50% of the total current. Note that these two resistors must be capable of handling the full current output of the power supply. A short length of resistance wire is the best method of making these. Alternatively, 5 feet of 24 swg copper wire wound into a coil, air spaced, will work equally as well, but will take up more space. Note that these resistors will dissipate some heat and this should be allowed for.

Fully variable current limiting is provided by RV 2. As the current drain from the supply increases, the base current of the output pair will be increased by the regulator, and the voltage drop across the

potentiometer will increase. The voltage across this resistor is applied to a transistor within the chip. When this exceeds 0.6V the transistor becomes biased on and shunts any further current from the output.

Note that RV 2 may be placed in any position where the current which flows through it is proportional to the total current drawn from the supply. The three choices are (i) in series with the output of the supply itself, (ii) as shown on the diagram and (iii) in series with the chip (pin 10) and the base of Q1.

Choice (i) is less satisfactory because the resistor must carry the full output current, i.e. 5 amps. This means that the resistor may be required to dissipate some 3 watts of power, and potentiometers of this rating are not cheap. Positions (ii)

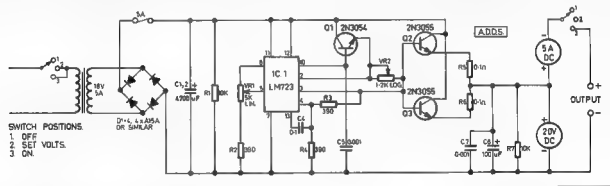


FIG. 1.

promise in this regard. The circuit is based on one in the National Semiconductor literature,¹ and, in the form described will deliver better than 5 amps at up to 15 volts with current limited from 0 to 5 amps, fully variable.

The circuit is based on the LM 723 integrated circuit, which is a DC regulator IC. Note that in the discussion that follows, the pin numbers that are used are for the DIL package. If the metal can type is used, all the pin numbers are different.

The chip supplies a reference voltage, temperature stabilised, of typically 7.15V at pin 6. A voltage divider, RV 1 and R 2, taps off a variable voltage between 0.7 and 7.15V and applies this to pin 5. Output feedback is combined with this voltage in an error amplifier to give an output voltage on pin 10 of about 2.2 times the voltage reference, i.e. between 1.5 and 15 volts. The chip is capable of delivering currents of up to 150 mA from pin 10.

Output from this point is fed to the base of a 2N3054 transistor, Q1, in an emitter follower configuration. The output of this transistor, which can be a current of up to half an amp, is fed to the bases of a pair of transistors in parallel, Q2 and Q3.

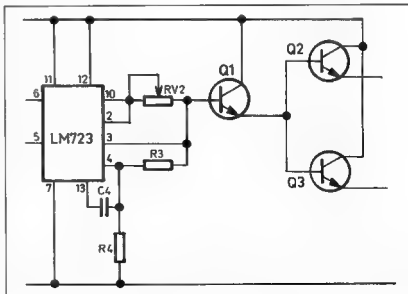


FIG. 2. MODIFICATIONS TO CURRENT LIMITING

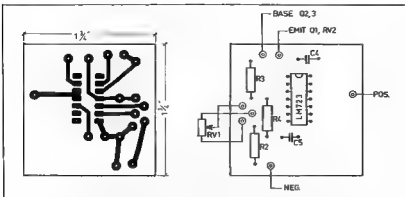


FIG. 3. CIRCUIT BOARD AND COMPONENT LAYOUT

and (iii) are both acceptable, but the position used was found to be the best in practice. Should you wish to use position (ii) the modifications are shown in figure (ii). This has some advantage in that the power dissipation in the potentiometer is lower than in the other position. Both positions, however, have a sufficiently low current to enable a normal carbon potentiometer to be used. A logarithmic taper potentiometer is used to give a better spread of current range on the calibration, but the calibration is reversed, i.e. the highest current is with the potentiometer anticlockwise. A reverse log potentiometer, if available, would put this around the other way.

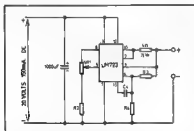


FIG. 4. 150 mA SUPPLY

CONSTRUCTION

The IC and the smaller components can be mounted on the printed circuit board as shown, or mounted on veroboard. The remaining components are best mounted

on tag strips or tied to the appropriate points.

The output transistors, and preferably the driver as well, should be mounted on large, efficient heat sinks, and insulated from the chassis. The metering shown is, obviously, optional. SW 2 as shown is a three position switch. The three positions given are 1. OFF, 2. SET VOLTS, in which all circuitry is on and the voltage may be adjusted to the desired value, but the output terminals are still disconnected, and 3. ON, in which output is now connected to the terminals.

The current limiting may be calibrated on the front panel with reasonable accuracy. A version under development at present will have an additional switch position whereby the current limit may be set on the ammeter, and the ammeter will have several switched ranges. This will not add much to the overall complexity, and the modification may be published if sufficient interest warrants it.

The circuit board as shown is very versatile. As it is, with the addition of a couple of resistors, it can be used as a 150 mA supply by making the appropriate connections (see fig 4). Similarly, by the addition of a transformer with a higher rating and additional output transistors in parallel the maximum current could be increased to many times the original 5 amps.

If voltages above 15V are required, the whole circuit could be built above ground and a set of zener diodes switched in to raise the voltage; e.g. a 10V zener would

give a range of 11.5V to 25V, etc. Note that the voltage across the IC must not be allowed to exceed 35V.

A higher current version could perhaps be built to power an Atlas HF transceiver for less cost than the commercial power supply.

MEASURED PERFORMANCE

A study of the performance curves shown will indicate that the power supply puts up quite a creditable performance. The data was measured on the prototype, and verified by measurements on a second unit built to the same design by David, VK3ANP. At the full 5 amps, ripple was measured as 0.5V at a supply voltage of 15V, i.e. 3.3% ripple. Note that this was measured with the output virtually short circuited, no current limiting. At 4 amps, 15V, the ripple was 0.0025V, or 0.016%. At 3 amps the ripple was undetectable on a BWD 509 B oscilloscope. Analysis of the regulation curves shows that the regulation is about 3% or better, particularly at the higher voltage ranges.

A 30W two metre FM transmitter running on the power supply showed no hum present on the signal received at a range of 1 mile, on a listening test.

On three units constructed to date no problems have occurred, so the supply seems to be easy to get going.

REFERENCES

1. National Linear Integrated Circuits — National Semiconductor.
2. Linear Applications — National Semiconductor.

TRY THIS WITH THE TECHNICAL EDITORS

MODIFICATION TO THE TE-15 TRANSISTOR DIP OSCILLATOR

R. G. Farnsworth VK3BHJ

Here is a simple mod which allows true wavemeter operation with the TECH TE-15 transistor dip oscillator.

This relatively cheap device operates quite well as a "dip" meter for finding the resonant frequency of tuned circuits, but its performance as a wavemeter leaves a little to be desired.

By switching the 1K emitter resistor of the oscillator transistor in or out of circuit, normal or wavemeter operation is achieved (respectively). A miniature toggle switch was used and can be inserted in either side of the 1K, although the earthy side is suggested.

The beauty of this mod. is that the meter only deflects when there is RF present, e.g. no more varying oscillator level or false dips when you're looking for RF. The sensitivity control still works as such but tuning is broader with low sensitivity.

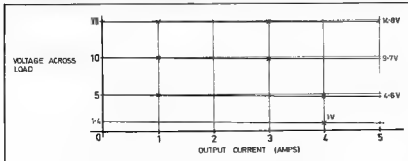


FIG. 5. VOLTAGE REGULATION

TRANSVERTER MODEL MMT432/144

UTILIZING an IF of 144 MHz ★ 10 WATTS DRIVE or ½ WATT
★ VOX OPERATED

This 432 to 144 MHz linear transverter is intended for use with a 144 MHz transceiver to produce a high reliability transceive capability. A 10 watt load and RF sensing network eliminates the need for any ancillary circuitry. A single coaxial connection is all that is required between the transverter and the associated 144 MHz transceiver.

A wide range of applications is offered by this MMT432/144 transverter, which by virtue of its linear mode of operation will enable 144 MHz SSB, FM, AM or CW equipment to be used at 432 MHz.

Simply connect direct to your 2 metre rig, 12 volt supply, fit 70 cm antenna for instant SSB, FM, AM, CW operation.

FEATURES High quality double-sided glass fibre printed board ★ Highly stable zener controlled oscillator stages ★ PIN diode aerial changeover relay with less than 0.2 dB through loss ★ Extremely low noise receive converter, typical 3 dB ★ Separate receive converter output gives independent receiver facility ★ Built in Automatic RF VOX with override facility ★ Built in 10 watt 144 MHz termination selectable attenuator for ½ watt ★ Use of the latest state of the art Power Amplifier transistors provide reliable 10 watts continuous output.

MODEL MMT432/144 — Price \$260

NEW RELEASE — TRANSVERTER

MODEL MMT432/285

Features extended coverage for Oscar 8.

Second Crystal Oscillator gives two ranges: Low, 432-434 MHz — High, 434-436 MHz. Programming available to either Transmit/Receive both Low both High, or a mixture of the two. Adjustable Drive Level is now provided by an input potentiometer. Optional RF VOX.

Power Output 10 watts minimum ★ 28 MHz IF ★ Drive 1 mW to 500 mW ★ Aerial Changeover by PIN diode switch ★ Modern Microstrip Techniques ★ Power requirements 12 volt nominal at 150 mA 2.5 amp. peak ★ Case size 187 x 120 x 53 cm ★ Spare 432 input socket

MODEL MMT432/285 — INTRODUCTORY PRICE: \$235.



MMT432 TRANSVERTER

500 MHz COUNTER

SPECIFICATION

Digit Height	10 mm
Display Width	45 mm
Case Size	111 x 50 x 27 mm
Frequency Ranges	0.45 - 50 MHz, 50 - 500 MHz
Sensitivity	Better than 50 mV RMS over 0.45 - 50 MHz Better than 200 mV RMS over 50 - 500 MHz
Input Connector	50 ohm BNC
Input Impedance	200 ohm approximate
Power Connector	5 pin 270 deg. locking DIN socket (supplied with plug)
Power Requirements	11 - 15 volts DC at 300 mA approximately

Model MMD500/500 — 500 MHz Counter, \$175

LINEAR AMPLIFIERS FOR 70 CM — 90-100 WATT AVAILABLE SHORTLY

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FEATURES 24 MHz LOCAL OSCILLATOR OUTPUT FOR TRANSVERTER USE

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Typical Gain: 30 dB
Noise Figure: 2.5 dB

Typical image rejection: 65dB
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Power requirements: 12 volt ± 25% at 35 mA

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1296 MHz CONVERTER

Microstrip, Schottky diode mixer
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Noise figure: typ. 3.6 dB
Overall gain: typ. 30 dB
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144 MHz MOSFET CONVERTER

Noise figure: typ. 2.8 dB
Overall gain: typ. 30 dB
IF: 20-30 MHz, 9.15 V 20 mA

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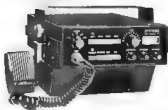
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FT-75B High power, for General use. FT-75BS Low power, for Novice use



Even the compact and sports car enthusiast can enjoy all band, SSB mobile operation, with the FT-75B "Mini-Mobile" transceiver. Features include a 120 Watt transmitter with provision for three, variable crystal controlled frequencies on each band; as well as provision for external VFO operation. The FT-75B is all solid state except for the final and driver stages and includes a built-in noise blander and squelch circuit.

The FT-75BS has one final tube removed and PS transformer tapped to reduce power to approx. 30W PEP output. When full call is obtained the set can be re-modified back to original condition.

TECHNICAL DATA — FT-75B

GENERAL

Frequency Range: 80 M 75 KHz segment, 40 M 100 KHz segment, 20 M 160 KHz segment, 15 M 240 KHz segment and 10 M 400 KHz segment

Mode: Upper Sideband for 20, 15 and 10 meter bands. Lower Sideband for 80 and 40 meter bands. CW for all bands.

Frequency Control: Crystal control VKO with 3 channels per band

VFO Coverage: ± 3 KHz for 80 M, ± 3 KHz for 40 M, ± 3 KHz for 20 M, ± 3 KHz for 15 M and ± 6 KHz for 10 M

Antenna Impedance: 50 Ohm unbalanced.

Size: 210(W) x 80(H) x 300(D) mm.

Weight: 3.8 Kg.

RECEIVER

Sensitivity: 0.5 μ V for 10 dB Noise plus Signal to Noise Ratio on 14 MHz for SSB and CW

Selectivity: 2.3 KHz nominal bandwidth at 6 dB down, 4.8 KHz at 60 dB down on SSB and CW

Harmonic & Other Spurious Response: Image Rejection better than 50 dB. Internal Spurious Signal below 1 μ V equivalent to antenna input. Automatic Gate Control: AGC threshold nominal 1 μ V. Attack time 5 millisecond and release time 15 seconds.

Audio Output: 2 Watts at 4 Ohm impedance.

FT-75B, inc. one crystal for each band 3565, 7065, 14,200, 21175 28550 kHz, mic. & inst. book

TRANSMITTER

Input Power: 120 Watts PEP on SSB and 100 Watts on CW at 50% duty cycle (slightly lower on 10 meter)

Microphone: 50 K Ohm dynamic type

Carrier Suppression: ~ 40 dB

Sideband Suppression: ~ 40 dB.

Spurious Radiation: ~ 40 dB.

Distortion: ~ 30 dB.

Final Tube: 120B7 x 2.

JA87575-23

FP-75B or BS, AC PSU

DC-75B or BS DC PS, inc. mobile mounting bracket

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Export inquiries welcomed

Filter Type	XF 9A	XF 9B	XF 9C	XF 9D	XF 9E	XF 9M	XF 9NB
Application	SSB- Transmit	SSB Receive	AM	AM	FM	CW RTTY	CW RTTY
Number of Filter Crystals	5	8	8	8	8	4	8
Bandwidth (6dB down)	2.5 kHz	2.4 kHz	3.75 kHz	5.0 kHz	12.0 kHz	0.5 kHz	0.5 kHz
Passband Ripple	< 1 dB	< 2 dB	< 2 dB	< 2 dB	< 2 dB	< 1 dB	< 0.5 dB
Insertion Loss	< 3 dB	< 3.5 dB	< 3.5 dB	< 3.5 dB	< 3.0 dB	< 5 dB	< 6.5 dB
Input Output	Z _i	500 Ω	500 Ω	500 Ω	1200 Ω	500 Ω	500 Ω
Termination	C _i	30 pF	30 pF	30 pF	30 pF	30 pF	30 pF
Shape Factor	(6 50 dB) 11.7	(6 60 dB) 11.8	(6 60 dB) 11.8	(6 60 dB) 11.8	(6 60 dB) 11.8	(6 40 dB) 2.5	(6 80 dB) 2.2
		(6 80 dB) 2.2	(6 80 dB) 2.2	(6 80 dB) 2.2	(6 80 dB) 2.2	(6 60 dB) 4.4	(6 80 dB) 4.0
Ultimate Attenuation	45 dB	100 dB	100 dB	100 dB	90 dB	90 dB	90 dB
Price	\$31.95	\$45.45	\$48.95	\$48.95	\$48.95	\$34.25	\$83.95

In order to simplify matching, the input and output of the filters comprise tuned differential transformers with the "common" connections internally connected to the metal case.

Registration Fee: \$2.00; Air Mail 31c per 1/2 oz. Shipping weights: Filters 2 oz. ea. Crystals 1/2 oz. ea. All Prices in US Dollars.

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XF900 Carrier	9000.0 kHz	\$4
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Oscillator Crystals 50 MHz through 150 MHz available to order. Parallel resonant (30 pF) to 20 MHz, series resonant above 20 MHz. Write for quotation to your requirements (include mechanical size & frequency).

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Discriminators for XF 9F

	Freq	Dev	Slope	Price
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XD 9 03	12 kHz	50 mV/kHz		\$24.10

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FILAMENT SWITCHING FROM A DISTANCE

P. Renton VK4PV,
20 Harold Street, Townsville 4810

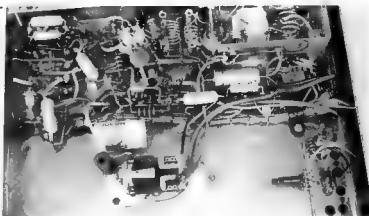
How to fit filament switching to a hybrid mobile rig without disfiguring the front panel.

Several months ago, I permanently installed a 2 metre Pye Overland mobile rig in my car, with the battery supply taken from the cigarette lighter circuit. As most people seem to do, I once left the rig running all night and found in the morning that I had a very flat battery, which was most embarrassing.

In order to prevent this from recurring, I then re-arranged the supply to come from the vehicle "accessory" fuse. This ensured that the rig would run only when the ignition was switched on, or if the ignition key was turned to "accessory".

The Overland is completely transistorised except for the driver and final valves in the transmitter. The next logical step seemed to be to fit a panel mounted filament switch to further reduce current drain when not transmitting. This scheme was rejected, however, as I felt that there were already enough additional controls on the front of the unit. I then decided to design a relay operated system, and have been very pleased with the results.

In operation, the rig is now normally left switched on at the front panel, with the receiver operative all the time the car is



inside 2 metre Pye Overland showing installation of filament switch.

being used. When it is necessary to transmit, the PTT button on the microphone is pressed momentarily and then released for approximately 20 seconds to allow the filaments time to heat up. When the button is pushed, the panel lamp lights, indicating that the transmit mode has been selected, and the unit is operated normally from this time on.

If it is desired once again to reduce the current drain, the set is switched off momentarily at the front panel and then on again. The transmitter filaments and panel lamp will now remain out of circuit until the PTT button is once again pressed momentarily.

The circuit is very simple, and I have shown the additional wiring as dotted lines (Fig. 1). As soon as the PTT switch is pressed, both relays RLA and RLB are energised. RLB then remains energised via its own hold-in contact RLB1 until such time as the battery supply is interrupted for any reason. From here on the valve filaments and the pilot lamp also remain energised via contacts RLB2. As soon as the PTT switch is released, RLA is de-energised, as diode D2 prevents RLA coil current from flowing through contact RLB1.

Relay RLB has almost full battery voltage applied to its coil while the PTT switch is closed, thus giving it a good pull-in force. To reduce long-term battery drain as far as possible, I included a 68 ohm limiting resistor in series with the hold-in contact. The value of this resistor should be determined experimentally to give secure holding-in of the relay at the lowest practical coil current.

In fitting the filament relay RLB, I chose to mount it on a small aluminium bracket which was then fastened beneath the chassis using two small self-tapping screws. This resulted in minimum disfigurement of the chassis with this particular type of relay.

As an indication of the benefits to be gained when using filament switching (whether by panel mounted switch or by relay), the standby current of my rig dropped from 800 mA to 38 mA after this modification. This makes it well worth the effort, particularly if operation for long periods in a WICEN net is a possibility. ■

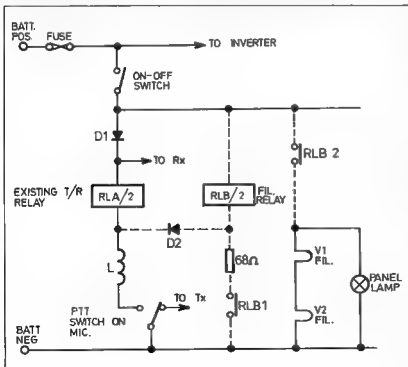


FIG. 1. Control relay circuit.

DARWIN AMATEUR RADIO CLUB — POST TRACY PROGRESS

Trevor Lloyd, VK8ZTW
Publicity Officer, DARC

The Darwin Amateur Radio Club wish to express their sincere thanks to those amateurs who assisted by the generous donation of \$1038.39, which was made available to restore an operating station at the club.

The equipment purchased from the fund were two IC-22As, FT101E and a HAM 2 rotator. This equipment has been labelled, "This equipment was purchased from funds donated by amateurs after Cyclone Tracy, December 1974."

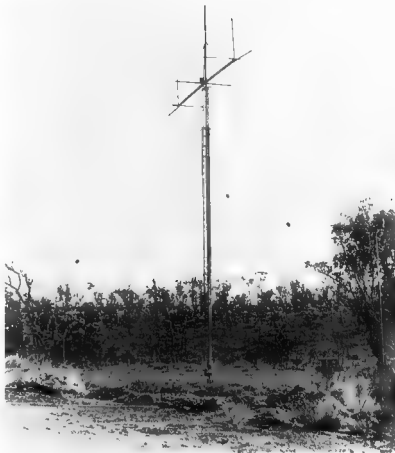
Regular use is being made of the equipment and the rigs have been made available to members for outside club usage to maintain operational stations and extra 2 metre stations for fox hunts.

Owing to the brief nature of this entry in AR, it is anticipated that a detailed account of events regarding the restoration of the DARC since the cyclone will be forth-coming in a future issue. On the 7th of November, the Darwin Amateur Radio Club will have celebrated 11 years of successful achievement at their 132nd General Meeting. To commemorate this occasion, the members will be enjoying an anniversary dinner.

Furthering the interests of Amateur Radio in Darwin, the DARC will be presenting a display at the Northern Territory



Operating Centre at VK8DA



3-Element Full Size 20 Mx Beam — Gamma Matched.

Communications Convention to be held at the Darwin Community College on the 3rd and 4th of December. The Minister for Posts and Telegraphs, Mr. E. Robinson, will be officiating at the opening. Also attending will be Mr. D. Williamson and Mr. D. Caudle from the Regulatory and Licensing Section; Mr. C. Hurst VK5HIJ VK5 Divisional President and Mr. D. Wardlaw, WIA Federal President and Mr. M. Hurst-Meyers, National Director National Citizens Radio Association.

Participants at the display will be Darwin Community College, branches of the armed forces, Telecom, Department of Transport, Overseas Telecommunications Commission and other Government Departments, Commercial and non-commercial interests.

The theme for the convention is the role communications play in the development of the Northern Territory, the training schemes available to the public in commercial and non commercial fields and

the benefits to the public of Amateur Radio through greater awareness will also be featured prominently.

The convention promises to be a tremendous success due to the co-operation of the Government, Military and Commercial interests.

The DARC hereby extend a warm welcome to all amateurs to attend this commemorative convention.

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WITH THE
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1296 MHz SSB

1296 SSB may not be as difficult as it sounds. Instead of varacting FM up to 23cm why not use the varactor to both

multiply up from 578 MHz and mix up the output of your FT221 or TS700 on 144 MHz.

In Electron, March 1977, the following circuit was described by H. R. van Leeuwen PA0DBQ. He obtained an output



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For further information and specifications write, phone or call in!

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Constructed for long trouble-free operation. 200 kg vertical weight capacity. Extra heavy duty disc brake that prevents wind-milling.

NEW Model DX-555 Counter-Generator Minerator:

440 kHz to 30 MHz in 3 ranges
Output displayed on counter and available at jack on rear panel 600 Hz modulation for AM receivers.

Counter:

6 digit display 7 digit readout capability 10 Hz to over 30 MHz (250 MHz with prescaler). Input level 20m Vrms to 5 Vrms (Prescaler 200m Vrms to 2 Vrms). Base oscillator beats directly against WWV

NEW Counter-Generator Two vital pieces of test equipment in one.



DENTRON MLA-2500

Dentron Radio has packed all the features a linear amplifier should have into their new MLA-2500. Any Ham who works it can tell you the MLA-2500 really was built to make amateur radio more fun.

NEW NATIONAL — RXJ7011 — Unique SSB/CW 160-10 metres transceiver with dual digital readout and matching speaker and external VFO.

TRIO KENWOOD: TS520S — SSB/CW, 160-10 metres with optional digital read-out

TRIO KENWOOD: TS820S, 160-10 metres digital read-out

TRIO KENWOOD: TS820, 160-10 metres.

TRIO KENWOOD: TS700A — 144-148 MHz all mode transceiver

TRIO KENWOOD: TS600A — 50-54 MHz all mode transceiver

TRIO KENWOOD: TR-7400A — 144-148 MHz FM transceiver

YAESU MUSEN: FT-7401E — 160-10 metres AM, SSB, CW transceiver

YAESU MUSEN: FT301 series, 160-10m AM, SSB, CW transceivers.

RECEIVERS:

TRIO KENWOOD: R300 general coverage BCL receiver

YAESU MUSEN: FRG-7 general coverage Rx, Wadley cop system

INTRODUCING LINEAR AMPLIFIERS:

DENTRON RADIO CO.: MLA-2500, 160-10m linear amplifier.

DENTRON RADIO CO.: MLA-1200 — 80-10m linear amplifier

DENTRON RADIO: 160-10L Superamp, 160-10m near amplifier

SCS: HF3-100 L2, 3-30 MHz bi-linear amplifier.

SCS: 2W10-80 L, 144-148 MHz, FM/SSB linear amplifier.

YAESU MUSEN: FL-2100B, 80-10 metres linear amplifier

ANTENNAS:

HUSTLER — 4-BTV — vertical trap antenna

HUSTLER — Mobile vertical trap antenna (80-10m).

ANTENNA TUNERS:

DENTRON MT-3000A **DENTRON 160-10AT**

DENTRON 80-10AT

RF Preamplifiers for 3-30 MHz Band:

Model SX-59 for use with transceivers.

SPECIFICATIONS

Frequency range 3-30 MHz in 3 bands; 3-7, 7-14,

14-30 MHz

Gain 20 dB nom. (at 7 MHz), front panel variable control

Attenuator — 20 dB attenuation selectable from front panel control

Impedance 50 or 75 ohm systems, UHF connectors on rear panel.

Power handling capability 100W thru relay contacts — Power supply built-in VAC fused supply — Semiconductors 3 FET S ze 67 (H) x 150 (W) x 146 (D) mm (2 54 x 5 91 x 5 75 in.) Weight 1 kg (2 2 lb.)

Switching requirements requires external relay contact switching when used with transceivers. Remote contacts read, y available from most amateur HF transceivers including TS-510, TS-511, TS-520, TS-820, FT-101, FT-401, FT-200 & FT-201.



of 500mW PEP on 1296 MHz for inputs of 6 watts on 144 MHz and 3 watts on 576 MHz.

A varactor multiplier to 576 MHz was described in AR in April 1971. Suitably throttled back it would make a fine driver for the circuit shown.

Several days later (took time out for CW practice) back to the grindstone, and eventually the frequency reached 7 MHz. At one stage the frequency decreased between grinds, and I presumed that some moisture must have remained on the crystal. A final rinse with methylated spirits is recommended; I used dry cleaning fluid and this was an error as the crystal stopped oscillating. A good polish with Brasso, rinse, etc., restored activity the final frequency being about 7006 kHz.

In conclusion, I cannot recommend the use of Ajax on mirrors as it spoils the glass, and neither would I undertake to move a crystal frequency more than a couple of hundred kHz. Now I would like to try lowering a crystal frequency by copper plating. More of that anon.

Sue VK8SU, from "Ground Wave", May/June 1977.

INTERFERENCE IN COLOUR TELEVISION SETS

Some television sets are very susceptible to interference from the lower HF bands especially 3.5 MHz. This interference is very hard to eliminate and seems to come from interaction between the direct transmission—not harmonics—and the frequencies associated with the colour sub-carrier (4.4 MHz) frequency.

The television antenna picks up the 3.5 MHz signal and this gets directly into the set.

The solution is to prevent a path being available for the 3.5 MHz transmission and this can be done by using what is in effect a transmission line transformer as a choke. Obtain a toroid, the larger the better, and either wind the TV ribbon through it, making as many turns as possible, or alternatively do the same thing with the three core power flex. In the latter case a very effective toroid to use is the ferrite yoke which is used on some colour picture tubes. Also large toroids can sometimes be obtained from disposals and these are large enough to take a number of turns of normal three core cable.

In either case, the result is that there is no path from the TV antenna through the set to earth through the flex for the RF, and a potential cannot be built up across the internal parts of the set which will interfere with the colour frequencies.

This solution has also proved useful in the case of interference from strong local broadcast stations.

OUTLET PLUG FOR LOW VOLTAGE POWER SUPPLY

With the increasing availability of transistorised gear, many hams are home-brewing low voltage power supplies for energising their mobile gear in the shack for test and/or base station operation.

If the power supply is fitted with a car type cigarette lighter receptacle the mobile gear can be energised via the lighter receptacle in the car or from the bench supply with a minimum of fuss.

Bruce L. McCubbin VK3SO.

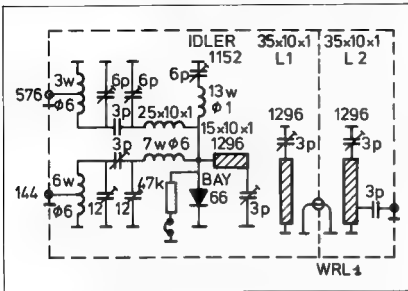


FIG. 1. Coils L1 and L2 are placed 8 mil. above the Chassis.

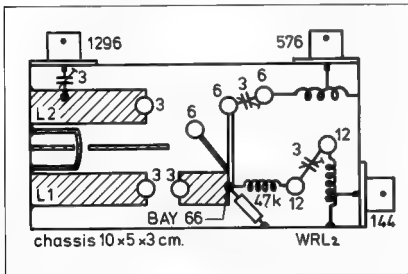


FIG. 2.

THE GENTLE (?) ART OF CRYSTAL GRINDING

Presented with a crystal, frequency 6840 kHz, style FT-243 and stern warnings about grinding gently, I set to work cautiously on a mirror removed from the bathroom, this being the only handy bit of plate glass. The recommended practice for raising the frequency of crystals is to remove the crystal from its holder (of course!) and grind the top side of the quartz plate on grade 200 wet and dry. Both sides of my crystal looked the same

(it was an old reference book) so I ground both sides.

Heeding warnings, I began cautiously, using Brasso — grind, rinse in water, dry, replace in holder and check frequency. No change! I progressed to using smokers' tooth powder — still no change. Then tried Ajax, which had an astonishing effect on the mirror, but none on the crystal frequency. Rubbing on a piece of wet and dry (on the mirror) had some effect and the frequency went up about 60 kHz after about 15 minutes grinding.

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LATEST KF-430

12 CHANNEL

FITTED WITH 2 CHANNELS

Price Ex-Stock — Hong Kong

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10 WATT



SPECIFICATIONS:

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TRANSMITTER —

Spurious: —60 dB below
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If you have held an amateur licence for 25 years or more you are eligible for membership of the Radio Amateurs Old Timers Club now active in all States. If you would like to become a member contact Harry Cliff VK3HC, Max Hull VK3ZS, Stan Dixon VK3TE, Snow Campbell VK3MAR, the founder Bob Cunningham VK3ML or any existing member of the Club for details of certificate, etc.

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TS-820 SERIES TS-820 - \$750-820 \$1,100 KENWOOD

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Kevin Phillips, VK3AUQ

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- 3-4 YRLR Anniversary Phone Party
- 5-6 RSGB 7 MHz CW
- 12-13 European RTTY Contest
- 13 Czechoslovakian Contest
- 15-20 WDXA CW Contest
- 26-27 CQ WX CW Contest

- 3-4 Spanish Phone Contest
- 10-11 Spanish CW Contest
- 10-11 ARRL 10 Metre Contest
- 10-11 Hungarian Contest
- 10-Jan-85 ROSS HULL VHF/UHF MEMORIAL CONTEST

January 27-29 CQ Wv 180 CW Contest

MEMORIAL CONTESTS

0000 to 2400 GMT Sunday November 13

All bands 1.8 to 36 MHz may be used, both phone and CW the same station may be contacted on each band for QSO and multiplier credit. Crossband and crossmode contacts not permitted.

Classifications are: single operator, single band and all band, and multi-operator all band only. Exchange RST plus 3 figures and calling your ITU. Score 1 point per QSO, 3 points if it's a Cliché station. Multiply total QSO points by sum of ITU zones worked on each band for your final score. Own country may be worked for multiplier credit, but not for QSO points.

Certificates will be awarded to the top scoring station in each class in each country.

Use a separate log for each band, include a summary sheet and a signed declaration that rules have been observed.

Send entry to the CENTRAL RADIO CLUB, PO Box 68, 113 27 Praha 1, Czechoslovakia. Mailing deadline is December 31st.

ROSS HULL VHF/UHF MEMORIAL CONTEST

The Wireless Institute of Australia invites Amateurs and SVLAs to join in this annual contest which is held to perpetuate the memory of Ross Hull, who did so much to further VHF/UHF.

A Perpetual Trophy is awarded annually for competition between members of the WIA, and is inscribed with some details of the man the contest honours. The name of the winning member of the WIA for each year is inscribed upon the trophy and that member also receives a suitably inscribed certificate.

OBJECTS

Amateurs from Australia and Territories will endeavour to contact as many other Amateurs as possible under the following conditions.

DATE OF CONTEST

10th December 1977, 0001 GMT to 24th January 1978 2400 GMT

DURATION

Any seven calendar days within the dates mentioned above which need not be consecutive. These periods are at the discretion of the WIA. A calendar day is from 0001 GMT to 2400 GMT.

RULES

1. There are two divisions, one of 48 hours duration, and the other of 7 days duration. In the 7 day division there are four sections.

- (a) Translating Oper
- (b) Translating Phone
- (c) Translating CW
- (d) Receiving Oper

As open log is one where points are claimed for more than one mode, i.e. Phone, CW, RTTY, ATV, SSTV (AM, FM and SSB are grouped together as phone).

In the 48 hours division, the best score over any consecutive 48 hour period is the winner. In the 7 day division, the best score over any seven days (not necessarily consecutive) is the winner.

2. Any Amateur operating fixed, mobile or portable within the terms of his licence may participate.

3. All Amateur VHF/UHF bands may be used, but crossband contacts are not acceptable. At any one time, single frequency operating only is permitted. Cross mode contacts are permitted.

4. Amateurs may enter for any one of the sections and either or both divisions. 7 day certificate winners are not eligible for 48 hour awards.

5. Two contacts per band per day, irrespective of mode are permitted provided that at least two hours elapse from the previous contact with that station on that band.

6. Logs from a multi operator station are not acceptable. One operator only may operate a station at any one time, and must submit a log for his own operation.

7. Entrants must operate within the terms of their licences.

8. The exchange of RST or RST reports with a serial number starting at 001 and advancing by 1 for each successive contact will be proof of contact.

9. Entries should be set out on Quarto sheets, using one side of the paper only, and must be forwarded to reach the Federal Contest Manager, Wireless Institute of Australia, Box 67, East Melbourne, 3002, in time for the first opening of logs on Friday, February 17th. Envelopes should be clearly marked Ross Hull Contest. Early logs will be appreciated.

10. Scoring will be based on the following table.

Freq.	Less than 200 km	More than 200 km	More than 200 km
Band	200 km	within Call Area	other Call Area
144	2	5	10
128	2	5	10
432	18	18	25
576	10	25	80
1296 and 20	80	80	100

Bonus points. Each new call area contacted, 20 points, once only per band per day (including own call area).

Operation via active repeaters or translators not permitted for scoring purposes.

11. Logs should be set out as in the example and must carry a front sheet showing the following information.

- Name
- Address
- Section
- Call sign
- Claimed 7 day score
- Operating days
- Operating dates
- Highest 48 hours score
- Operating period
- Declaration — I hereby certify that I have operated in accordance with the rules and spirit of the contest.
- Comments

12. All times to be logged in GMT only.

13. Awards. Certificates will be awarded to the highest scorers in each section, in each call area. Additional certificates will be issued to contestants who break any VHF/UHF record during the contest.

The VK contestant who returns the highest score in the transmitting section, and who is a member of the WIA will have his name inscribed on the trophy which will be held by his Division for the prescribed period.

Certificates will be awarded to the highest 48 hours entrants in the transmitting section, who have not won a 7 day certificate.

REPEATING STATION

- 1. SWLs only may enter for this section.
- 2. Contest times and logging of stations will be the same as the transmitting section except that there will not be a 48 hours section.
- 3. Logs must show the call sign of the calling station, the serial number, given, and only the call sign of the other station. Scoring will be as for transmitting stations.
- 4. Any scoring contacts may be logged. There is no limit to the number of times that a station may be logged provided that serial numbers are given.
- 5. The logs for any 7 days may be submitted and the winner of the section will be highest score.
- 6. Certificates will be awarded to the highest scorer in the contest, and if sufficient interest is shown, to state winners.

GENERAL

It is preferable that complete logs be submitted as soon as possible to checking, but contestants must clearly show their best 7 days or 48 hours.

Enjoy yourself! In another friendly contest, and remember — it is only as friendly as you make it.

EXAMPLE OF A VK3 TRANSMITTING LOG

Date/Time	GMT	Band MHz	Enthusiasm	Call sign	Call sign	RST sent	RST rec	Points	Notes
0156	52	SSB	VK4DT	99001	58037	10	20		
0207	52	CW	VK4XA	586002	578012	10	—		
0212	144	SSB	VK7ZAK	58003	58003	59462	10	20	
0216	432	SSB	VK3ZBB	58004	59462	10	20		
0320	1296	SSB	VK3ATN	53005	52023	50	20		

WESTLAKES NOVICE CONTEST

Westlakes Radio Club announces a new contest for all novice and fully licensed radio amateurs. The contest will take place on the 10th and 11th December, 1977 from 0800 GMT on 10th to 0700 GMT on 11th December, 1977.

OBJECTS

To encourage contest working between amateur stations in Australia and New Guinea during a 24 hours period with special emphasis on contacts with Novice and Radio Club stations.

RULES — STATIONS ELIGIBLE

All VK and PZ stations licensed for amateur operation in the 80, 15 and 10 metre band may take part. Calls within and outside the call area of the calling station are eligible. Except for Radio Clubs, no multiple operator working is allowed.

BANDS

All the 80, 15 and 10 metre allocations may be used. But Novice operators must observe the band limitations outlined in their licence. No cross band operation allowed but cross mode operation is allowed. Contacts may be made phone or CW.

SCORING

Full Call Operators: For contacts with other full call stations: 2 points per contact; with Novice call stations: 1 point per contact; with Radio Clubs: 10 points per contact.

Novice Call Operators: For contacts with other Novice stations: 5 points per contact; with full call stations: 2 points per contact; with Radio Club stations: 10 points per contact.

Listeners: For Novice to Novice contact: 5 points; for full call to novice or novice to full call: 3 points; for full call to full call: 2 points for contacts in which a Radio Club is involved 10 points, all 10 metre loggings 10 points.

All contacts on 10 metres are worth 10 points irrespective of call being worked.

CALLING PROCEDURE

Stations should call "CQ Novice Contest" on phone or "CON" on CW. Stations may be worked once only per band per mode.

FOR ALL 10 METRE CONTACTS ONLY

Stations may be worked once per mode each clock hour, e.g. a station may be worked at 0156 and again at 0201 but not again until 0300.

Consecutive contacts with the same station may be worked on phone and CW provided that the second contact is commenced before the end of the clock hour, e.g. VK2NZ2 works VK7Z2Z on phone at 0258 and they say "go to CW". The CW contact commences at 0259 but does not end until 0301. This is a valid call in the clock hour 0200-0300.

EXCHANGES

Telephone stations should exchange five (5) digit numbers consecutively in chronological order commencing with —001. The first two numbers would indicate signal strength and readability e.g. 5 by 9. CW stations should exchange six (6) digit numbers in order commencing with —001. The third number in this case would be to indicate lone listener stations should log both numbers and call sign in an exchange. Radio Clubs will add "C/C", e.g. 58003 C.

ELECTRONIC ENTHUSIASTS EMPORIUM

POPULAR INTEGRATED CIRCUITS IN STOCK

CA3012	CD4026	CD4124	LM3380N	MC1496K	UAA180
CA3013	CD4027	CD40098	LM331N	MC1590G	UA723C
CA3018	CD4028	CD40098	LM332N	MC14553	LM723
CA3023	CD4029	CD40174	LM337N	MC1848P	UA757
CA3028A	CD4030	CD40175	LM339K	MC4044P	ULN2200
CA3035	CD4031	CD40192	LM555C/M	OM802	ULN2111
CA3039	CD4032	80000000	LM555H	SAJ110	74C00
CA3046	CD4040	CD40195	LM556N	SAK100	74C01
CA3053	CD4041	OM8097	LM562B	SD305DE	74C02
CA3059	CD4042	HEF	LM565A	SD306DE	74C03
	CD4043	LM5670	LM566C/M	SL435A	74C04
	CD4044	LM114H	LM567C/M	SL437D	74C05
CA3080	CD4045	LM3001AN	LM709N	SL440	74C06
CA3081	CD4046	LM3001CN	LM710C/M	SL447	74C150
CA3082	CD4047	LM3004A	LM710C/M	SL448	74C162
CA3083	CD4048	LM3005AM	LM723H	SL449	74C164
CA3086	CD4050	LM307N	LM723H	SL450	74C180
CA3089	CD4051	LM308V	LM723H	SL451	74C182
CA3090S	CD4052	LM309K	LM733C/M	SL452	74C184
CA3091	CD4053	LM310W	LM733N	SL453	74C187
CA3120E	CD4056	LM311A	LM741C/M	SL454	74C191
CA3127E	CD4060	LM311N	LM741C/M	SL455	74C192
CA3128E	CD4063	LM312H	LM747C/M	SL456	74C197
CA3130T	CD4070	LM317K	LM747C/M	SL457	74C200
CA3140T	CD4071	LM318N	LM748C/M	SL458	74C201
CA3600	CD4072	LM319H	LM748C/M	SL459	74C202
CD4000	CD4073	LM320K	LM748C/M	SL460	74C203
CD4001	CD4074	LM320K	LM748C/M	SL461	74C204
CD4002	CD4075	LM322T	LM748C/M	SL462	74C205
CD4005	CD4076	LM322N	LM748C/M	SL463	74C206
CD4006	CD4077	LM322N	LM748C/M	SL464	74C207
CD4007	CD4078	LM322N	LM748C/M	SL465	74C208
CD4008	CD4079	LM322N	LM748C/M	SL466	74C209
CD4009	CD4080	LM322N	LM748C/M	SL467	74C210
CD4010	CD4081	LM322N	LM748C/M	SL468	74C211
CD4011	CD4082	LM322N	LM748C/M	SL469	74C212
CD4012	CD4083	LM322N	LM748C/M	SL470	74C213
CD4013	CD4084	LM322N	LM748C/M	SL471	74C214
CD4014	CD4085	LM322N	LM748C/M	SL472	74C215
CD4015	CD4086	LM322N	LM748C/M	SL473	74C216
CD4016	CD4087	LM322N	LM748C/M	SL474	74C217
CD4017	CD4088	LM322N	LM748C/M	SL475	74C218
CD4018	CD4089	LM322N	LM748C/M	SL476	74C219
CD4019	CD4090	LM322N	LM748C/M	SL477	74C220
CD4020	CD4091	LM322N	LM748C/M	SL478	74C221
CD4021	CD4092	LM322N	LM748C/M	SL479	74C222
CD4022	CD4093	LM322N	LM748C/M	SL480	74C223
CD4023	CD4094	LM322N	LM748C/M	SL481	74C224
CD4024	CD4095	LM322N	LM748C/M	SL482	74C225
CD4025	CD4096	LM322N	LM748C/M	SL483	74C226
CD4026	CD4097	LM322N	LM748C/M	SL484	74C227
CD4027	CD4098	LM322N	LM748C/M	SL485	74C228
CD4028	CD4099	LM322N	LM748C/M	SL486	74C229
CD4029	CD4100	LM322N	LM748C/M	SL487	74C230
CD4030	CD4101	LM322N	LM748C/M	SL488	74C231
CD4031	CD4102	LM322N	LM748C/M	SL489	74C232
CD4032	CD4103	LM322N	LM748C/M	SL490	74C233
CD4033	CD4104	LM322N	LM748C/M	SL491	74C234
CD4034	CD4105	LM322N	LM748C/M	SL492	74C235
CD4035	CD4106	LM322N	LM748C/M	SL493	74C236
CD4036	CD4107	LM322N	LM748C/M	SL494	74C237
CD4037	CD4108	LM322N	LM748C/M	SL495	74C238
CD4038	CD4109	LM322N	LM748C/M	SL496	74C239
CD4039	CD4110	LM322N	LM748C/M	SL497	74C240
CD4040	CD4111	LM322N	LM748C/M	SL498	74C241
CD4041	CD4112	LM322N	LM748C/M	SL499	74C242
CD4042	CD4113	LM322N	LM748C/M	SL500	74C243
CD4043	CD4114	LM322N	LM748C/M	SL501	74C244
CD4044	CD4115	LM322N	LM748C/M	SL502	74C245
CD4045	CD4116	LM322N	LM748C/M	SL503	74C246
CD4046	CD4117	LM322N	LM748C/M	SL504	74C247
CD4047	CD4118	LM322N	LM748C/M	SL505	74C248
CD4048	CD4119	LM322N	LM748C/M	SL506	74C249
CD4049	CD4120	LM322N	LM748C/M	SL507	74C250
CD4050	CD4121	LM322N	LM748C/M	SL508	74C251
CD4051	CD4122	LM322N	LM748C/M	SL509	74C252
CD4052	CD4123	LM322N	LM748C/M	SL510	74C253
CD4053	CD4124	LM322N	LM748C/M	SL511	74C254
CD4054	CD4125	LM322N	LM748C/M	SL512	74C255
CD4055	CD4126	LM322N	LM748C/M	SL513	74C256
CD4056	CD4127	LM322N	LM748C/M	SL514	74C257
CD4057	CD4128	LM322N	LM748C/M	SL515	74C258
CD4058	CD4129	LM322N	LM748C/M	SL516	74C259
CD4059	CD4130	LM322N	LM748C/M	SL517	74C260
CD4060	CD4131	LM322N	LM748C/M	SL518	74C261
CD4061	CD4132	LM322N	LM748C/M	SL519	74C262
CD4062	CD4133	LM322N	LM748C/M	SL520	74C263
CD4063	CD4134	LM322N	LM748C/M	SL521	74C264
CD4064	CD4135	LM322N	LM748C/M	SL522	74C265
CD4065	CD4136	LM322N	LM748C/M	SL523	74C266
CD4066	CD4137	LM322N	LM748C/M	SL524	74C267
CD4067	CD4138	LM322N	LM748C/M	SL525	74C268
CD4068	CD4139	LM322N	LM748C/M	SL526	74C269
CD4069	CD4140	LM322N	LM748C/M	SL527	74C270
CD4070	CD4141	LM322N	LM748C/M	SL528	74C271
CD4071	CD4142	LM322N	LM748C/M	SL529	74C272
CD4072	CD4143	LM322N	LM748C/M	SL530	74C273
CD4073	CD4144	LM322N	LM748C/M	SL531	74C274
CD4074	CD4145	LM322N	LM748C/M	SL532	74C275
CD4075	CD4146	LM322N	LM748C/M	SL533	74C276
CD4076	CD4147	LM322N	LM748C/M	SL534	74C277
CD4077	CD4148	LM322N	LM748C/M	SL535	74C278
CD4078	CD4149	LM322N	LM748C/M	SL536	74C279
CD4079	CD4150	LM322N	LM748C/M	SL537	74C280
CD4080	CD4151	LM322N	LM748C/M	SL538	74C281
CD4081	CD4152	LM322N	LM748C/M	SL539	74C282
CD4082	CD4153	LM322N	LM748C/M	SL540	74C283
CD4083	CD4154	LM322N	LM748C/M	SL541	74C284
CD4084	CD4155	LM322N	LM748C/M	SL542	74C285
CD4085	CD4156	LM322N	LM748C/M	SL543	74C286
CD4086	CD4157	LM322N	LM748C/M	SL544	74C287
CD4087	CD4158	LM322N	LM748C/M	SL545	74C288
CD4088	CD4159	LM322N	LM748C/M	SL546	74C289
CD4089	CD4160	LM322N	LM748C/M	SL547	74C290
CD4090	CD4161	LM322N	LM748C/M	SL548	74C291
CD4091	CD4162	LM322N	LM748C/M	SL549	74C292
CD4092	CD4163	LM322N	LM748C/M	SL550	74C293
CD4093	CD4164	LM322N	LM748C/M	SL551	74C294
CD4094	CD4165	LM322N	LM748C/M	SL552	74C295
CD4095	CD4166	LM322N	LM748C/M	SL553	74C296
CD4096	CD4167	LM322N	LM748C/M	SL554	74C297
CD4097	CD4168	LM322N	LM748C/M	SL555	74C298
CD4098	CD4169	LM322N	LM748C/M	SL556	74C299
CD4099	CD4170	LM322N	LM748C/M	SL557	74C300
CD4100	CD4171	LM322N	LM748C/M	SL558	74C301
CD4101	CD4172	LM322N	LM748C/M	SL559	74C302
CD4102	CD4173	LM322N	LM748C/M	SL560	74C303
CD4103	CD4174	LM322N	LM748C/M	SL561	74C304
CD4104	CD4175	LM322N	LM748C/M	SL562	74C305
CD4105	CD4176	LM322N	LM748C/M	SL563	74C306
CD4106	CD4177	LM322N	LM748C/M	SL564	74C307
CD4107	CD4178	LM322N	LM748C/M	SL565	74C308
CD4108	CD4179	LM322N	LM748C/M	SL566	74C309
CD4109	CD4180	LM322N	LM748C/M	SL567	74C310
CD4110	CD4181	LM322N	LM748C/M	SL568	74C311
CD4111	CD4182	LM322N	LM748C/M	SL569	74C312
CD4112	CD4183	LM322N	LM748C/M	SL570	74C313
CD4113	CD4184	LM322N	LM748C/M	SL571	74C314
CD4114	CD4185	LM322N	LM748C/M	SL572	74C315
CD4115	CD4186	LM322N	LM748C/M	SL573	74C316
CD4116	CD4187	LM322N	LM748C/M	SL574	74C317
CD4117	CD4188	LM322N	LM748C/M	SL575	74C318
CD4118	CD4189	LM322N	LM748C/M	SL576	74C319
CD4119	CD4190	LM322N	LM748C/M	SL577	74C320
CD4120	CD4191	LM322N	LM748C/M	SL578	74C321
CD4121	CD4192	LM322N	LM748C/M	SL579	74C322
CD4122	CD4193	LM322N	LM748C/M	SL580	74C323
CD4123	CD4194	LM322N	LM748C/M	SL581	74C324
CD4124	CD4195	LM322N	LM748C/M	SL582	74C325
CD4125	CD4196	LM322N	LM748C/M	SL583	74C326
CD4126	CD4197	LM322N	LM748C/M	SL584	74C327
CD4127	CD4198	LM322N	LM748C/M	SL585	74C328
CD4128	CD4199	LM322N	LM748C/M	SL586	74C329
CD4129	CD4200	LM322N	LM748C/M	SL587	74C330
CD4130	CD4201	LM322N	LM748C/M	SL588	74C331
CD4131	CD4202	LM322N	LM748C/M	SL589	74C332
CD4132	CD4203	LM322N	LM748C/M	SL590	74C333
CD4133	CD4204	LM322N	LM748C/M	SL591	74C334
CD4134	CD4205	LM322N	LM748C/M	SL592	74C335
CD4135	CD4206	LM322N	LM748C/M	SL593	74C336
CD4136	CD4207	LM322N	LM748C/M	SL594	74C337
CD4137	CD4208	LM322N	LM748C/M	SL595	74C338
CD4138	CD4209	LM322N	LM748C/M	SL596	74C339
CD4139	CD4210	LM322N	LM748C/M	SL597	74C340
CD4140	CD4211	LM322N	LM748C/M	SL598	74C341
CD4141	CD4212	LM322N	LM748C/M	SL599	74C342
CD4142	CD4213	LM322N	LM748C/M	SL600	74C343
CD4143	CD4214	LM322N	LM748C/M	SL601	74C344
CD4144	CD4215	LM322N	LM748C/M	SL602	74C345
CD4145	CD4216	LM322N	LM748C/M	SL603	74C346
CD4146	CD4217	LM322N	LM748C/M	SL604	74C347
CD4147	CD4218	LM322N	LM748C/M	SL605	74C348
CD4148	CD4219	LM322N	LM748C/M	SL606	74C349
CD4149	CD4220	LM322N	LM748C/M	SL607	74C350
CD4150	CD4221	LM322N	LM748C/M	SL608	74C351
CD4151	CD4222	LM322N	LM748C/M	SL609	74C352
CD4152	CD4223	LM322N	LM748C/M	SL610	74C353
CD4153	CD4224	LM322N	LM748C/M	SL611	74C354
CD4154	CD4225	LM322N	LM748C/M	SL612	74C355
CD4155	CD4226	LM322N	LM748C/M	SL613	74C356
CD4156	CD4227	LM322N	LM748C/M	SL614	74C357
CD4157	CD4228	LM322N	LM748C/M	SL615	74C358
CD4158	CD4229	LM322N	LM748C/M	SL616	74C359

CONTEST CLASSES

There are any classes in the contest — A: Novice/full calls working phone; B: Novice/full calls working CW; C: Novice/full calls working open; D: Listeners.

MULTIPLIERS

Notwithstanding the case of operation if ten (10) but less than 20 stations ** may be worked or heard on CW a multiplier of 1.2 may be applied to the total points score.

If 20 or more stations *** are worked or heard on CW a multiplier of 1.5 may be applied to the total points score.

*** On 10 metres it is possible to work a station more than once. Hence the score of stations worked for the purpose of the multiplier can only include the same station once, e.g.:

CW contact No. 19 VK2NZZ works VK2NZY at 0659. CW contact No. 20 VK2NZZ works VK2NZY at 0722 and has no more CW contacts. The multiplier (1.2x) may then only be applied since the CW station count is 19, not 20.

LOGS

Logs containing the details Station, time, band, mode, etc., must be kept. No. read, points tally should be made up with a front cover which contains the following details.

1. Name of operator and call sign.
2. Address.
3. Class for which entry is made.
4. Station worked (a) phone (b) CW.
5. Points claimed (call sign).
6. Multiplier (1 any).
7. Total points claimed.

DECLARATION

The declaration should also be made: "I have operated my station in accordance with the licence requirements and the rules and spirit of this contest." Signed and dated.

Logs should be sent to the Contest Manager by certified mail.

To:

West coast Radio Club,
Novice Contest Committee,
Box 1,
Terahua, 2284

Log entries close 15th January, 1978. Late entries will not be accepted.

The decisions of the committee are final and no correspondence will be entered into regarding the contest.

CONTEST AWARDS

Certificates will be awarded as follows:

- Highest Score,
Novice Phone
Novice CW
Novice Open
Full Call Phone
Full Call CW
Full Call Open
Full Call Phone
Radio Club CW
Radio Club Open
Listener Phone
Listener CW
Listener Open

A non-stake replica certificate will also be issued to all stations and listeners who take part in the contest indicating their participation. Results will be not in the February issue 1978 of the West Coast Radio Club Newsletter and in the April issue of Amateur Radio.

With this statement I most wholeheartedly agree. I do not however agree with the verbal comment that the Novice license is seen as the solution to cater for this interest. Obviously the "Pirate" response to the situation is to rush in and lay out a few hundred dB on a rig to get him out of the "narrow confines" of his band. Whilst, I agree, a large number of keen enthusiastic applicants are now working their way towards Novice and or full tickets as a result of a first bleeding in CB radio, unfortunately these comparative few are far from being representative.

Led us into this, from the day the authorities announced the impending legality of the CB service that band has been a shambles. Anyone who cares to listen to the band of channel switch flickers on 11 metres hears pouring forth the idiot jibberish, incoherencies, probabilities and hogwash of untrained uncomprehending and irresponsible button pushers. Those pirates of long standing, former users of the CB service are retreating, shuddering at the mess their nice little slice of spectrum has become.

The natural progression is for frustrated CB ops to obtain equipment to put them on other bands where spectrum space is less cluttered. In recent months I have heard everything from frustrated Novice "failures" driving their FT101s pretentiously up and down 80m, QRM-ing all and sundry, to undisguised CB/CB QSOs on 80.

The most recent and glaring example of invasion of amateur territory was on Saturday, 2nd September, when at least two stations of indeterminate identification and QTH spent most of their afternoon calling QV VHF CB on both RCH.2 and RCH.8 (VKG/RML/RGL respectively). Obviously these people have been able to purchase equipment fitted with paper crystals and probably the usual simplex channels. The problem is as always, there is no law against buying equipment, only against using it. The authorities either cannot or will not police the situation, as their track record with 27 MHz indicates.

Yet the answer lies within their grasp, a sales of transmitting equipment to licensed recipients on production of licence, photo and signature on licence, and that is that. It is obvious that a man who buys an FT101 or an IGC2 does not want it to decorate his cocktail cabinet. The current crop of equipment vendors have no excuses left now, the CB-ers had their way due to proliferation of equipment by these people until every Tom, Dick and Harry is in on the sales of CB radio. Meanwhile the legitimate amateurs have lost a band. Do we now sit by while sales of 2 metre and 70cm amateur equipment skyrocket into a million dollar industry and our bands become gaggles of squalling anonymity like 11 metres?

I trust that anyone, amateur or not, in the business of retailing two way communication equipment who continues to provide unlicensed recipients with other than CB equipment should be named, so that those amateurs who feel strongly about this situation may direct their business elsewhere. It is time that the Institute take a stand and that its members stood behind it to pressure legislation to prevent sale of equipment in the random manner existing at the moment.

I for one will volunteer to send a copy of this letter to my local M.P. to illustrate the potential developing problems.

Max Stark VK3APZ.

(Editor's Note: The Institute's opposition to the sale of equipment to unlicensed persons has been documented in AR many times over the past several years.)

The Editor,

Dear Sir,
The editorial in September AR emphasizes the futility of organizations representing amateurs throughout the world. The Radio Branch in this country has always been readily available for amicable discussions. Niggling in that area in editorials is to be deplored.

There seems to be little point in negotiating for additional privileges at WANC 79, whilst doing nothing to preserve the frequency allocations presently available.

Throughout the world, all active amateurs are aware that the greatest single handicap to current HF amateur operation is the 14 MW Russian "Woodpecker". This blatant incursion into the amateur portions of the HF spectrum has been

with us for a long time, rendering whole bands unusable, but I have yet to see one editorial in any amateur publication denouncing it.

Further, I have yet to see any evidence that official objections have been lodged at any level. Instead of ballyhooing about unimportant inconveniences, start demanding LOUDLY that the current, internationally agreed, frequency allocations of amateurs be observed.

Convincing the convinced is easy but futile. Start convincing those in power that they must protest strenuously, at the highest possible level, at this flagrant violation of amateur privileges.

Yours faithfully,

N W Lovell VK3ABH

(It is hoped the writer has duly reported his feelings to the Inter-Club Co-ordinator. It has been noted from overseas sources that at least one Government has taken up this matter with the USSR Government but there has not been too much improvement—Ed.)

The Editor,

Dear Sir,

CB RADIO

Well now we have these pests all over TV Channel 3 here in Newcastle. Most of the trouble is due to bad harmonics from 27 MHz superimposed on the visual carrier on 66.25 MHz. With half a dozen CB-ers going for the lick of their lives the consequent degradation of the quality of the picture has to be seen to be believed.

Some of us are old enough to remember the days when a group of illegal operators causing endless TVI would speedily be rounded up and put off the air.

The tragic part of this is that these people know perfectly well that they are causing this interference and couldn't care less. They blame everyone and everything except their own ignorance and lack of common sense. The only technical knowledge the 3rd harmonic could be suppressed.

I am one of those who has said all a long time that transmitting equipment should not be allowed into the hands of people with no knowledge of the principles.

We read in AR that the Institute has opposed CB Radio. How true! How sad!

Yours faithfully,

Colin Yates, B.E. (VR2AGZ)
(Chartered Electrical Engineer)

The Editor,

Dear Sir,

ROSS HULL VHF-UHF CONTEST

In reference to the letter by VK2ZFB, Mr. A Birch, in September AR, I agree with most of his remarks on the contest and possibly that the image of the WIA has not been enhanced by the changes in contest rules.

There is an urgent need for a new set of rules to be drawn up for the contest based on the general rules for other contests. The caution on rules should not rest with any one individual, but with contest committees formed from volunteers from each State Division, and who are interested in this and any other contest. A submission from each State Division should be drawn up and agreed to by rules and agreed to by a unanimous vote among the committees. Any changes to the rules should go through the same procedure.

Clearly it is too late for a change along these lines for this year's contest, but the machinery should be set up now to have everything completed in time for next year's Ross Hull.

To encourage greater participation I would like to see improvements to the contest rules along these lines:

1. Abolish the 7 day and 48 hour sections.
2. Introduce separate logs for each band.
3. Have separate SSB, FM, OPEN and CW sections on each band with entry restricted to one person.
4. Have sections for satellite contacts on 2m and 70cm.
5. Replace the bonus system with an overall multiplier for each band, each call area counting the same in the multiplier.
6. Have separate sections for each State's highest scorer on each band.

Yours sincerely,

Mike Hennessy VK7MC
P.O. Box 52, Sorrell, Tasmanian 7172

LETTERS TO THE EDITOR

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

The Editor,

Dear Sir

PIRACY PREVALES

I would like to refer readers to AR of August 1977, page 5, and quote from the special announcement therein, "The general view is that a percentage of CBers will feel the need to expend their interests beyond the narrow confines of their service".

The Editor,
Dear Sir,

Regarding CB operating in the USA, I am regularly in contact with K9NS in Vista, California, both by ham radio and by letters. He has sent me some newspaper clippings from an LA newspaper, and the article gives quite an insight on the problem of CB radio in the West Coast of USA.

The thing I did not know was that it is illegal in the USA to communicate at distances greater than 150 miles and the penalty for doing so is a fine of \$100 per violation to maximum of \$500!

I think that a limit on distances should be applied in Australia as well, because I get harassed when I hear several local CBers boasting of how much 'DX' they've worked on 27 MHz, not just across Australia but with Japan, Canada and the USA.

It is ridiculous that we amateurs have to be technically competent to operate our equipment(s) and yet these non-technical persons can get away with it for the price of the licence fee.

Another point of interest in the latest K9NS letters concerns two new RFI bills being pushed through the US Congress at the present time, which will force all TV and radio set manufacturers to install filters and traps at the factory before sale to the public another good idea worth following up.

Certainly in my location I get a variety of equipment complaints via air mail, some of these can be attributed to local colour TV sets so there are many quite urgent new pieces of legislation required in Australia to protect 'hams' as well as TV viewers and radio listeners from interference.

So there you are, my first letter to the Editor is a long one, hope I've made my thoughts a little clear.

Keep up the present high standard of the 'journal'. I read it through from cover to cover and also purchase a number of items extracted from the various publishers, so it's very good work.

Fred Jenkins VK2BFJ

(The newspaper clipping was enclosed with Fred's letter, but is unfortunately a little too long to reprint. The article mentioned the proliferation of CB, illegal use, and of course the usual interference problems. Thanks, Fred, for the comments.—Ed.)

141 Hyde St, Nth Rockhampton, 4701

The Editor,
Dear Sir

I wish to support the remarks of Albert Birch, VK2ZFB in the September issue of AR, regarding the Ross-Hull VHF Memorial Contest Trophy, and would suggest that the following rules be considered and applied:

- 1 That all those entering the Contest allocate themselves a specific number, to be used following the report given to the station worked. This would add to the competitive spirit of the Contest. With the present sequence number, everyone knows how the other fellow is going, and it gets too tricky to guess who there is and does not end in a log. This was most noticeable in the 1976-77 Contest. Hundreds more were in the Contest than logs sent in.
- 2 That the winners on each 7 day and 48 hour section in each call area be issued a certificate, as has been in the past. This gives a great deal more incentive to make more contacts.
- 3 The present system of scoring be left as is and also the duration times of the Contest, of 7 days and 48 hours.

Previous to the last 'Ross-Hull', VK4DD was the first in VK4 twice in both sections, and last time first in VK in both. For this I have been awarded three certificates and the Trophy only for 75% — so when the Trophy goes down there is nothing for the hours and effort. Surely a certificate award is warranted for the winners.

To complete the list of winners mentioned in VK2ZFB's letter, the following were successful after VK2BFJ, VK2ZER, 5ZKFR, 3AKC, 4ZFB, SSU. It is my

It is to be hoped that the Contest Committee will give consideration to the suggestions offered.

Harold L. Hobler, VK4DO

The Editor,
Dear Sir,

I refer to the article by Donald Pugh VK6DN on the "Teaching of Morse Code" and wish to thank him for his contribution to this important area of Amateur Radio training. I should like to submit further suggestions.

On the market are various Morse Training Schemes. Some involve "one-cassette" courses which I do not favour. I can see no alternative to "Cassette Courses" of 4 or 5 C-90 cassettes offering the Morse Alphabet and the Numerals in "small bites", each "bite" being taught at drilled and re-played by the students. As each new portion is learned, revisionary exercises should be added to include all the previously-learned letters and figures. Finally a stage will be reached where the student will KNOW all the symbols and will require only PRACTICE Cassettes to consolidate his receiving skills at the five or higher "words per minute" rate. There should, therefore, be a distinction between TEACHING (or LEARNING) cassettes and PRACTICE cassettes.

The attitude of the Instructor will largely determine the enthusiasm shown by the students. The Instructor should indicate that he really enjoys Morse operating.

One of the most important features of Morse training is the necessity for students to HEAR GOOD MORSE and to appreciate the good features LONG BEFORE they put a hand to Morse Key.

Even adult students in Theory, Regulations and Morse like to gain praise for their successes. This is sound educational practice. The use of PROGRESS WIND CHARTS has always been a worthwhile method of recognition — even with youngsters of 40, 50 and 60 years!

There is considerable difference of opinion regarding the necessity or desirability of using CODE GROUPS in practice sessions. Some instructors hammer the need to eliminate "Journalising". Others maintain that the Novice and Beginner examinations consist of PLAIN LANGUAGE passages. Therefore, the writing of PRINTED CODE GROUPS under class conditions involves a skill (printing) that is irrelevant to the Telecom Examination. Ordinary handwriting is a legitimate standard should be the case of Novice Morse examinations.

Instead of CODE GROUPS, I have found that FOREIGN LANGUAGE text serves to test the journalising practice. This is PLAIN LANGUAGE material and should be handwritten. Students find this quite acceptable.

I find it preferable to do-practice the whole of the Morse material and to reinforce the amount of Key-punching in front of the class. We have them for about 2 1/2 hours per week — on ONE night. This makes it essential for them to "do their homework" and this can ONLY be done by the cassette or tape system.

Some overseas Morse training information suggests that two raw beginners should send to each other NO WAY! Too much time can be lost later by efforts to eliminate the errors and bad habits gained during this period. In our Novice classes we can defer the sending instruction until the reading skills have been developed at five words per minute.

After the Telecom Examinations candidates have a waiting period, during which Morse instruction should be continued. Simulated contacts can be practised on the Club Audio Oscillator set-up. Correlation between the Regulations, operating procedures and Morse can be developed. Club Amateur Stations can be put to good use by permitting the Novice members to operate on CW with other Stations — preferably by prior arrangement. In short, the Novice examination should not be regarded as the final goal — merely an incidental step on the way to Full Amateur status.

Morse Instructors may be interested enough to obtain "AN INTRODUCTION TO MORSE CODE", which I prepared for the NSW Youth Radio Service. This contains a wide range of ideas and questions for the teaching of Morse, and is intended to stimulate discussion. It is NOT intended to be dogmatic. There is no BEST WAY to teach Morse, Individual Instructors should use trial and error methods, persisting with those that have proved successful and rejecting those which experience shows to be unsuccessful.

R. C. Black VK2Y2

(This letter has been shortened to assist early publication . . . Ed.)

MYTH

Contributors to letters to the Editor are requested to keep contributions to no more than 300 words so that all may have a chance of being published. Ed.

ATV NEWS

KEVIN CALLAGHAN VK3ZJV
PETER COSSINS VK3BFG

At the time of writing this column Kevin VK3ZJV and myself have developed a working prototype for an ATV kit, sign carrier, and 8-line circuit details were provided for the unit in the last issue of AR. The prototype is an improved unit which accepts any video source and superimposes the data stored in two PROMs. Any 32 x 8 PROMs with suitable pinouts can be used in the circuit. Switching is provided to make possible a number of display variations. Kevin has also developed a programmer for the Harris 8256 and we can provide a service on the basis of no guarantee at a cost of \$5 if the PROM is supplied or \$10 if we supply the PROM. Circuit boards for the project will be available and enquiries for programming or boards can be made to the writer.

All revenue from this project will go towards meeting the cost of the proposed Melbourne ATV Repeater VK3RTV. PROMs have already been programmed and sent to Winston VK7EM and John VK6KG.

Molotova has a new RFP device out which may be of interest to ATV-ers. It is a MRF45A and has a maximum output power of 45W. Les Jenks VK3ZSJ is working on the design of a board for a pair of these devices as a linear amplifier. He estimates that the output power from this board would be comparable to a 4CX250B. It is the advantage of no machine work in construction, wide bandwidth and a single 12V supply.

It is good to see a number of stations joining in on the 7.065 MHz 1.6m frequency after the VK3BW broadcast on Sunday mornings. It is a nice way of exchanging ideas and keeping in contact with latest developments in each State.

With activity at a high level it may be possible to chalk up some interesting DX this summer and possibly increase the current ATV record between the north coast of Tasmania and Melbourne.

P. J. Coates VK3BFG

20 YEARS AGO

OCTOBER 1957

1957 was the International Geophysical Year, with amateur radio stations throughout the world participating in the study of VHF propagation.

Federal Executive had the following to say on the Editorial page of October 1957 Amateur Radio:

"It is fitting that an opportunity has come for amateurs to take part in this aspect of IGY studies on at least portion of the old 50-MHz band. Evidence collected by members of the WIA and submitted by Executive to the ABCB and Amateur Administration relative to the transfer of amateurs to make room for TV channels. The problem of long distance interference was particularly stressed."

A new Amalgam receiver was announced about this time. The Edgystone 888 was available from R. H. Cunningham Pty Ltd. Perhaps where we complain about the present high price of amateur gear, we should look back. The 888 was \$222.00.

Technical articles in October Amateur Radio included part three of "90 RF Phase Shift Networks", by M. L. Southwell VK2ZSF. EHT without Tears, by M. Riley VK2AR2. Solenoid rectifiers were used in a voltage multiplying circuit to produce EHT for a modulation meter for scope.

Antenna Couplers for 50 and 144 MHz was reproduced from an earlier QST article.

Eric Trebilcock BE8R155 told that potential SWL produced a bill of nostalgia with radio 31 Years Ago."

With interest in the new mode of SSB running

high, a talk on the subject at the Victorian Division meeting was a sell-out. One of the reported statements made is interesting. "Rather elaborate gear is required in the Service and Commercial fields using this form of transmission, but the same high degree of perfection is not required on the Ham band." Well perhaps not, but times do change.

IONOSPHERIC PREDICTIONS

Len Poynter VK3ZGP/NAC

Further to my comments last month there have been renewed bursts of activity throughout September and conditions generally have improved considerably. September was a month of spectacular solar flares and I think it can be said that "it ain't" really going on the boil. The solar flux is rising significantly with an August mean of 84.83 and September up to 99.8. The A index whilst rising spectacularly on occasions had means of 12.33 and 17.39 for the same period. Predictions for the solar flux for this period was 85 and 88. August being slightly lower but September quite a deal higher.

The smoothed sunspot began for August was 29.9 with the running smoothed number for Feb. 77 being 18, a significant rise since July's 12.7. Predicted smoothed running numbers for Nov. - 32, Dec - 34, Jan - 36, Feb - 38, at Sept. 1, 1977

From overseas reports it appears May and June provides a sure sign of Cycle 21 beginning to emerge. With all the higher bands 20, 21, 14 MHz being the Mains Happy Hunting Grounds. Even those who don't chase DX found their logs filled up with stations in all continents, a different situation to the previous few years wallowing in the minima conditions. Many are getting excited at the prospect that the high might prove to be much earlier than originally expected and run as high as the old quoted 86 peak.

However these conditions exist at the commencement of a new period of high solar activity. Each burst of energy puts new life into a somewhat dispersed ionosphere and it follows that the good conditions soon find plenty of activity particularly in the portions of the bands with a high density population. On 21 MHz the US Novice CW portion is starting to sound like 27 MHz CB, only the CW QRM is quite high not to mention the JA phone area is now really alive. The VK Novice segment is now attracting considerable attention in anticipation of some early DX. Already 28 MHz is OSBing in and out almost daily to the joy of many.

It appears much interesting scientific information was obtained during the minima and you can be sure the forthcoming peak will be even more closely observed than previously. Ground level and satellite observations have added tremendously to our knowledge but many frustrating events still leave the experts bewildered. There are still many unexplained events awaiting analysis and perhaps an answer. There is so much data being produced that it will take a lifetime to even study it, let alone some of its implications. One thing seems certain that propagation predictions will undergo many changes in the years to come. However reliability is still not quite within the grasp of these experts but the degree of reliability is increasing yearly. One likely outcome of recent conditions is a world wide early warning network. Of course we already have ours but just how good we can tune the system up remains to be seen.

Don't forget WWV at 18 minutes past the hour gives the solar indices for yesterday GMT - It's invaluable for record keeping. High solar flux low A index is a sure way of knowing conditions are good. The local K index is a fair guide to forthcoming conditions. K moving higher - poor, K dropping - good. Keep an ear out for it daily on 10 MHz or 5 MHz after 0600 UTC.

70s, good DX, VK3MAB

AWARDS COLUMN

Brian Austin, VK5CA
P.O. Box 7A, Craters SA, 5152

WCPRSE AND WACPR (IARC GENEVA) General

- The award is available to licensed amateurs.
- Contacts on and after 1/1/1968 are valid.
- Do not need QSL cards. A list showing full details of the contacts, including the ITU Zone, should be certified by a club official or two amateurs.
- The award is issued for 2 x SSB, all CW all phone, all RTTY and all mixed modes.
- The award is issued to the operator and any number of call sign locations may be used.
- The fee for the award is \$1 or 10 IRC. Stickers are available for a stamped envelope or 3 RC.
- The address for application is -
Harry L. Whiting W2JXH,
20 Peconic Place,
Hol day City, Tom's River
NJ 08753 U.S.A.

Note: In addition to the 75 ITU Zones, a further 15 areas are made up with SEA Zones giving a possible total of 90 Zones.

Rules: QSL cards are not required if contacts are made during the annual IARC CPR Contest.

Requirements: WCPRSE - The basic award is for confirmed contacts with 60 stations and with stickers for 60, 70, 80 and 85 zones. With stickers 1 is necessary to submit any MM QSL cards to the Awards Manager. WACPR - The award is for confirmed contact with all 90 zones. It is necessary to submit the QSL cards from all the 15 MM Zones to the Awards Manager.

WAC - WORKED ALL CONTINENTS (IARU) General

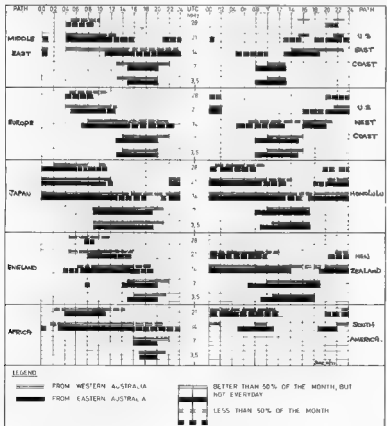
- The award is available to licensed amateurs.
- Contacts after 1945 are valid.
- Applicants should send cards to their IARU member society who will then certify the claim to the HQ society (ARRL) for issuance of the award. Where such a society exists applicants must be members of the society.
- Contacts must be made from the same location - the "same location" being taken as an area not exceeding 25 miles (40 km) in diameter.
- The award is normally issued for CW/phone but endorsements are available for 2 x SSB all 80 metres or at 180 metres.
- There is no fee for the award.
- Requirements: One confirmed contact is required from each of the six continents - North America, South America, Europe, Africa, Asia and Ocean A.

BROMSGROVE SILVER JUBILEE AWARD

(These rules have only just been received, but some of you might have qualified!)

Sponsored by Bromsgrove and District Amateur Radio Club to celebrate their Silver Jubilee 1977. Open to any radio amateur/SWL world wide.

- This award can only be achieved during 0001 GMT 4/8/1977 to 2359 GMT 12/8/77 (do coincide with special GE licences).
- All licence rules to be observed.
- Obtain 25 points any band/any mode/mixed (special endorsement if requested).
- GE3VGG must be worked/hrd = 1 point
Bromsgrove members = 2 points
All other GE stations = 1 point
i.e. GE3VGG-1, G8CLM, G8LIM-4 + 20 x GE Members worth 2 points each
G8CQ, G8AOY, G8RBL, G8AAL, G8DHF, G8WV, G8IO, G8JTK, G8LJM, G8KLO, G8JXT.
- All QSO direct, no use of any repeater/satellites on any band.
- Check log of QSOs before 31/12/1978.
- Special Certificate to be issued in silver print on confirmation of log by Award Manager G8KLO.
- Cost cheque/PO 50p or 4 x IRCs/\$1.
- Bromsgrove stations will call "GQ 51 ver Jubilee Award" (GQ-CC-B3).
- Any queries SAE/RC to G8KLO.
- Award Manager
J. K. Harvey G8KLO
22 Elm Grove,
Bromsgrove, BBI OEH, England





Deluxe Mobile/Base Station



FT-101E WITH R.F. PROCESSOR

● Solid State 160 thru 10 Meter Transceiver

The world's number one transceiver now offers even more value and performance in one compact, thirty pound package. An effective RF Speech Processor is built in integral part of this exciting transceiver. Now you can realize that extra talk power to cut through the pile-ups without the addition of a linear amplifier. Except for the final and driver stages, the FT 101E features the latest in solid state technology, incorporating time proven, plug in

"computer type" modules for unparalleled reliability and service. New lever type switches offer easier operation. Here is a complete radio station designed to go anywhere—ideal for today's active amateur. Just add an antenna and 12 VDC or 100-234 VAC for instant operation on 160 thru 10 meters. The FT 101E is another step forward in amateur communications from the world's leader in communications equipment—YAESU.

Compare these features with any other set in its class and you'll be surprised at the quality and price.

- Built-in AC & DC power supplies
- Built-in RF speech Processor for increased talk power
- 260 Watts PEP SSB, 180 Watts CW, & 80 Watts AM.
- Factory sealed, solid state VFO for optimum stability and accurate 1 KHz readout
- Effective Noise Blanker, threshold adjustable, for elimination of noise spikes
- Built-in, fully adjustable VOX
- Automatic break in CW operation with sidetone
- Selectable 25 kHz and 100 kHz calibrator
- +5 kHz receiver clarifier w/separate ON/OFF switch
- Built-in WWV/JJY reception
- Heater switch to shut off final tubes for conservation of current drain
- Reliable easy to operate lever switches
- Adjustable carrier level for tune up and novice operation
- Built-in speaker

- High-Q, permeability tuned, RF stages to provide the performance required even in base station operation
- Includes dynamic, hand held type microphone
- Indicator lights for internal VFO and clarifier operation
- Eight pole SSB filter for unparalleled selectivity on today's crowded bands
- All mode operation SSB, CW, & AM
- Built-in internal crystal control provision and Dual VFO adaptor

Optional accessories for the Ft-101E include:—
external VFO with four channel crystal control provision, CW filter, 6 and 2m transverters, digital readout adaptor, external speaker.

Bail Electronics also offer a complete service facility, and the plug-in modular construction of the FT 101E allows quick, easy servicing, keeping costs to a minimum.

● Price \$859.00

Above prices include S.T. Freight and Insurance is extra.
90 day warranty. Prices and specifications subject to change.



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Bob Arnold

VK3ZBB

When reading these notes it should be borne in mind that they are written about six weeks before publication, therefore please forgive any omissions or delayed information now and in the future.

I have received an interesting letter from Eddy Roach VK8ZNR/NER, who is operating portable VK8 from Giles, which is about the most isolated town in the country. Eddy is looking for contacts via Oscar 7 on both modes A and B, so far, we have not heard him in VK3 but expect to do so before long.

After hoping and trying for about twelve months, contact has at last been made on mode B with Stewart ZK1AA or Rararonga. QSOs with Stewart would be possible from the Eastern States during a period of ten days each month when ascending nodes of 165 or lower are in sight.

The period August/September has seen considerable activity on mode B with new stations appearing regularly. The following newnames have been heard Z1BIV, WJ; VK8ZGQ, VK7JG, VK5SV, ZAU, VK3ADR, ZK1AA.

Notes on contacts during this time: VK5SV — 4E VK3ZBB — ZK1AA.

Have you heard of the Oscar Award? This award is made for confirmed contacts with Six Austral or Call Areas plus Two Countries. QSL cards should be sent to Colin Hurd VK5HI, QTHR who is the award manager. Awards have been made to the following VK stations: VK5HI, VK5QR, VK5ZAD, VK3ZBB.

The qualifying conditions for the northern hemisphere are somewhat different from those for Australia and under these rules a total of 126 certificates have been issued. Thanks to AMSAT for these statistics.

Quite remarkable results have been made by mobile stations operating on mode B. VK5UE and Z1TF have been driving around their respective countries giving good signals through Oscar 7 despite their simple antenna systems—congratulations!

Gremlins interfered with the notes published in September on the Phase 3 spacecraft. The reference to power should read 50W NOT 50 mW as printed—more news on Phase 3 later, but meanwhile here is a summary of the AMSAT Oscar D Spacecraft System which is scheduled to fly early in 1978.

1 Japan AMSAT Association 2m-to-70cm Transponder (JA1CEJ, JG1CQD, JA1YDV, JA1JHF, and others) — "Mode D"

- Input frequency passband between 145.0 and 145.05 MHz. User should transmit right-hand circular polarization in Northern Hemisphere, left-hand circular polarization in Southern Hemisphere, 100W EIRP.

- Output frequency passband between 435.10 and 435.20 MHz (linearly polarized mono-axial antenna).

- Power output is 1 to 2 watts.

- Downlink passband is inverted from uplink passband.

- Linear operation — SSB and CW are preferred modes. Do not use FM.

- Morse code telemetry beacon at 435.095 MHz.

2 AMSAT Two-to-Ten Metre Transponder (WA4CGU and W3PK) — "Mode A"

- Input frequency passband between 145.05 and 145.95 MHz. User should transmit left-hand circular polarization in Northern Hemisphere, right-hand circular polarization in Southern Hemisphere, 100W EIRP.

- Output frequency passband between 29.40 and 29.50 MHz.

- Power output is 1 to 2 watts.

- Downlink is not inverted from uplink passband.

- Linear operation — SSB and CW are preferred modes. Do not use FM.

- Morse code telemetry beacon at 29.40 MHz.

3 Morse Code Telemetry System (W5CAV, WA4GDU et al.)

- Six analog input parameters measured.

- Converts each analog value into a two-digit Morse code number or word.

- A third digit precedes the telemetry value and gives the channel number.

- Morse code rate is 20 words per minute.

4 Telecommand System (W0GEY, WA3LND, W4ZCE, W4HUC, W3ITO, K1RT/WA1JZC)

- Turns the "Mode A" and "Mode J" transponders on and off.

- Initiates deployment of ten-metre dipole antenna.

5 Antenna and Antenna Deployment Module (W0GEY, W4HUC, W3ITO, K1RT, WA3LND)

14-to-28 Volt Power Switching Regulator (JA1TUR, W3HQ)

7 Battery Charge Regulator (DJ4ZC, K1RT/WA1JZC)

8 Instrumentation Switching Regulator (WA3VDH and W3GEV)

9 Magnetic Attitude Stabilization System (left-over from Oscars 5, 6 and 7)

10 Satellite Structure and Module Containers (K6GJS and others from Project Oscar, K1JY/WA1JZC, K1RT/WA1JZC, WA4GDU, W5EDPB, Henry Smith W4HSD and W3JG)

11 Satellite Interfacing and RF Cabling (Marie Harr and Others)

12 Engineering Drafting (WB4GHB)

AMSAT-OSCAR-D ORBITAL PARAMETERS

(Programmed orbit)

Apogee: 577.38 statute miles.

Perigee: 548.665 statute miles.

Period: 103 minutes.

Inclination: 99.00 degrees.

Time of Descending Node: 9:30 a.m. J-30 min.

— 0 min.

IAU NEWS

WARC 79

The following general information which appeared in the September issue of IARU Region 1 News is worthy of reproduction here for general interest.

CEPT

"During the preparations for WARC 1979 a great deal has been said and written concerning the role of CEPT. For the few who may be unfamiliar with this organization, the initials stand for Conférence Européenne des Postes et Télégraphes. This is a permanent body comprising the representatives of 26 European nations, formed into a number of committees and working groups, with the intention of formulating common policies on matters of mutual concern and interest. The working groups meet at regular intervals with the plenary meetings every 2-3 years.

The composition of the working groups is solely of the representatives of the 26 member nations. Commercial organizations do not directly participate in the work of the CEPT as they may in the studies of the ITU organizations, the CCIR and CCITT. There is no place in the working groups for representatives of any particular service, e.g. broadcasting, maritime, amateur etc. The views of the different services are expressed by the delegates from the national administrations.

Therefore the only way that national societies can influence CEPT is by consultation with their own national administration. If the administration accepts the view of the society it may then take the matters raised to a meeting of the CEPT.

What influence will CEPT have on WARC 1979? First, remember that the voting strength of the ITU now stands at 153. The CEPT has 26 members. These figures speak for themselves. Also, not all members of CEPT will necessarily agree on a common policy that will cause them to vote in a similar way at an ITU conference. It has been noted at previous ITU conferences that differing views were expressed by the Scandinavian nations, by the Francophon group and by the UK. In this case the maximum number of 26 votes would be split at least three ways.

This does not mean that CEPT is unimportant. It should be the duty of every national society whose administration is a member of CEPT to take the views of the amateur service to their administration and thus into the meetings of the CEPT.

How many national societies have done this? According to reports reaching the Region 1 secretariat, only a very small number. Why?

The IARU can advise and assist when requested but it does not have the power to talk with national administrations (unless asked). This is the duty of each national society. It is most strongly urged that the work, if not already commenced, should begin immediately before it is too late.

There are other organizations similar to CEPT, that exist in Eastern Europe and Africa e.g. DIRT and PANAFTEL. The same comments apply to liaison with these groups.

The IARU exists to combine, assist and advise. If your national society is of the opinion that we can help in any way please let us know without delay. Also — and most important — pass all Region 1 the results of your contacts with your administration. We sometimes need to remember that the amateur service consists of communicators.

From the same source comes the news of a meeting of IARU R1 members and non-members in Johannesburg for 3-4th December to talk mainly about WARC 79. At least 32 African countries are members of the ITU but have no amateur radio section.

Another short article from the journal would interest visitors to Europe —

4U1ITU

This very well known station is located on the third floor of the headquarters building of the International Telecommunication Union in Geneva, Switzerland. The International Amateur Radio Club, which is responsible for 4U1ITU, is supported by the IARU who recognize the high value of it as a liaison between stations in the headquarters of world telecommunications. The Secretary-General of the ITU, Monsieur M. Mi, is a Patron of the IARC.

There are many visitors to 4U1ITU and to keep the equipment in an operational condition is a difficult and lengthy task. During the past few months the IARC has had the valuable services of David Kaplan CB8AA who has offered to give a great deal of his time to maintaining 4U1ITU. David is a professional engineer and his help has been invaluable.

QSLs for the station are once again being handled by Gerard de Buren HB9AW, who devotes a great deal of time to this work.

The members of the IARC are all working persons and often it is very inconvenient to receive casual visitors. If you have the intention to visit 4U1ITU it would be appreciated if you would give notice of your forthcoming visit to the President of the Club, Ted Robinson, F8RU, IARC Box 6, Place des Nations, 1211 Geneva 20, Switzerland.

NZART has filed its formal submission to the New Zealand Post Office in relation to WARC 79. The frequencies requested are those set out in the IARU position paper.

IARU recognizes the importance of microwaves to the amateur service and reports several new second D170V is reported as having designed a new 3W/SSB 10 GHz equipment and others in Europe have designed simple gear for the same band. Is anyone interested? The REF (France) is sponsoring interest in 10 metres under the "use it or lose it" slogan.

BOOK REVIEW

"Solid State Design for the Radio Amateur" by Hayward and DeMaw. 256 pages. Published by ARRL, 1977 \$9.00 (US). Our copy courtesy of the publishers.

Seldom has a technical publication so excited the reviewer's enthusiasm as this. Readers of OST will have noticed over the past ten years or so that the name of Wes Hayward (W7OI) has

often appeared on articles of interest to the "home-brewer". Now he has, in partnership with Doug DeMaw (W1FB), the Technical Editor of QST, produced a textbook of outstanding value to all those interested in solid state communication equipment. It reflects thorough the professional competence of both authors. In part QST at WZ01 is an engineer with Tektronix, and freely acknowledges a great deal of assistance from that well-known company and other members of its Communications Division.

The book deals in nine chapters, with most significant aspects of transmitter and receiver design, plus test equipment, modulation methods, and field operation. Emphasis is mainly on applications in the HF bands, but VHF is not entirely neglected. There are five appendices on topics such as filter design, phasing-method SSB, and time-domain data. There is also an excellent bibliography of 2½ pages of references to the amateur and professional literature.

Actual items of equipment are described thoroughly in sufficient detail to enable the competent experimenter to duplicate them, in performance if not appearance. But the purpose of the book is not primarily to describe equipment. Rather, it is to discuss the principles involved in achieving the required performance and to show by example how the design requirements (often mutually conflicting) may successfully be reconciled. It achieves the aim better, in this reviewer's opinion, than any other single book yet published. Only the most disheveled "appliance-operator" could find it other than indispensable.

VK3ABP

"Newnes Colour TV Servicing Manual" by Gordon J. King, Volume 3, 233 pages. Published by Butterworths, 1977, \$18.00. Our copy courtesy of the publishers.

In as much as it refers entirely to colour TV receivers for operation on the 625 line PAL system, this book will be of interest to amateur television experimenters as well as service technicians. Some of the material presented is sufficiently general to be applicable to receivers used in Australia.

However, the greater part of the book consists of detailed descriptions, with qualitative functional theory of specific makes and models available on the English market. As such, it is not entirely relevant to the local scene. Particularly at the "tube and valve" level of control and test-point locations or circuit-board layout and connections it would be of little use to the Australian technician.

VK3ABP

MAGAZINE INDEX

Syd Clark, VK3ASC

BREAK-IN July 1977

Reception of Double Sideband Suppressed Carrier Transmission, The "Galbraith" Keyer Paddle GK1, Extending the Gating Time of the "Galbraith" Counter/Timer, Kenwood TS-630: Enhancement for CW Operation, A Short History of Channel D Meters, Borough or How to Set Up a Repeater in Several Hard Steps, World Problems in Radio Communication.

HAM RADIO May 1977

New Multiband Longwire Antenna Design, The Ground Screen, New Coaxial Balun, Antenna Transmission Line Analog, 10 GHz Broadband Antenna, Automatic Control of the Ham-M Rotator, Fine Tuning The Phased Array, Mobile VHF Antenna Comparison High Performance 60 Metre Antenna Using the Sorted Line, Remote Switching of Antennas, Raising Masts with a Gin Pole, Designing a Phased Array with a Hand Held Calculator, All Band Bob-Tail Cables.

QST June 1977

FM Repeater Audio—Good or Bad, Testing Grade-Out Integrated Circuits, Learning to work with Integrated Circuits, A High-Performance Low Frequency Converter, Build The Solid State Titan, Part 1, Design Your Own Active Audio Filters, Weak Signal Reception on 160 — Some Antenna Notes, What Does My S-Meter Tell Me, Phase III Toward the Ultimate Amateur Sale Site, Educators Learn About OSCAR and Amateur Radio, See OSCAR and Lots more at the Kennedy Space

Centre: Getting High for the Bi-centennial: The Silent Leaf Assault, Ham It Up on the Broadcast Band, Anderson Answered Local Hams do the Job, Assessing the CD Appointment Structure, Part 1, First Canadian WARC Proposals List New Ham Bands: Repeater/Remote Re-Regulation, Moved and Seconded, Are You Legal: The JARR Awards Program, The 1976 Bi-centennial Relay, Sixteen Years in Iran, The EP200 Story, Results, Seventy Annual ARRL 160 Metre Contest: Frequency Measuring Test: 1976 VE/W Contest Results.

RADIO COMMUNICATION August 1977

Observations on the Flyswatter Antenna, After Living with the GBIR 144 MHz Receiver, CMOS Crystal Controlled Toneburst, Modifying the Yaesu FT231 for 16 MHz Shift for UHF Repeater Working, The Datong UC-1 Up-Converter, Propagation Study for Satellite Links at 12 GHz.

73 May 1977

Build the World's Simplest Keyer, Stop that Auto-tuner, Predict the Weather, Learn a New Language, The History of Ham Radio, The Qly Realtime Wattmeter, SSV Slotman Game, Computer-Controlled Thermometer, Computerized RTTY Takeover, Let BASIC Control Your Next Contest, Satellite Zapper, VHF Noise Snapper, Understand Your Pet Rock, TTL Techniques, Sending HI, Build a DORR

for Your Mobile, Headphone Jack Adapter, Automatic Taping Unit, Let's Use English, CB to 10 — A Legal Alternative, The Ham Classroom, Save Your Old Speakers, Beware the Compressor, Matching Output Transformers, Stop Time-outs, Have You Tried Television Quick Vertical, Try Power Saver Logic, HF Bands Expander, Fight Inflation! Build It Yourself!, Wilson HT Mode, Try These IC-23C Modes, All Electronic Selfcall.

73 April 1977

Shout the Moon, Frustrating the Thieves, Automatic Autopatch Releases, Emergency 911 System, The Downspout Vertical RTTY That's What, Do-It-Yourself Photomasking, Making Your Own PC Boards, Curing Mobile Noise Misdemeanors, More on HRTTY, An Intelligent RTTY Station, Interrupts Explained, CW for the 8000, The Super Clock Add Class to Your Mobile, The Final Factor What about Surplus NICADs, The History of Ham Radio, Wind Your Own, Discriminator Output for the HR 2A, The Phantom Exposed, Relire to a Ham Heaven, Harnering the Buggy Sweepsakes, Taming the Wild Bars: A Combiter for Your 2m Whip, The Carbon Marvel, Minicom Receiver: Those Illegal CB Channels, Leading Zero Suppression, An FM Gadget, The Real Truth about SWR, Improving the Dipole, The 60 w.p.m. Conversion, Digital Autopatch: Harness the Wind.

AFTERTHOUGHTS

LOW COST VIDICON AMPLIFIER (AR September 1977)

ERRATA

Page 6, centre column, 2nd para. line 8 should read, "(FET input), and also facilities for line."

Page 6, RH column, 1st para. line 6 should read: "slope of 8 dB/octave or 20 dB/decade."

Page 6, RH column, 2nd para. line 2 should read, "low value load resistor will produce a low"

Page 7, LH column, 3rd para. line 3 should read: "gain of 4.7. Adjustable low frequency"

Page 7, RH column, 3rd para. line 20 should read: "across the +12V and earth rails at various"

Page 7, Circuit diagram. The bias divider chain for Q1 should have a 100 nF HI-K ceramic capacitor across the 100 V 16V bypass.

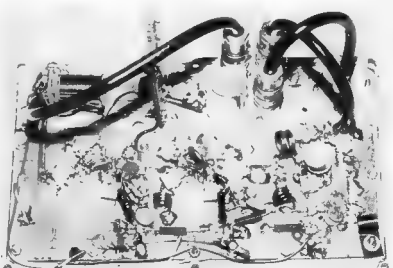
Page 8, centre column, 4th para. line should read: "at a certain distance from the camera, cor."

PLEASE NOTE:

WANTED.

S.S.T.V. contacts.
All mode, from
52 MHz to 432 MHz
Please contact VK2ZXL
C/O Sideband Electronic
Sales 621-7573 (02)

A view of the "works" of Ian VK3ALZ's 2 metre 20W linear. See AR October 1977 page 16. — Photo by VK3AFW.



WHAT'S BLACK & WHITE AND TURNS 2-METRE OPERATORS GREEN?



THE NEW KENWOOD TR-7400

This is the one, the Kenwood TR-7400 FM mobile transceiver of 25/10 watts and complete 2 metre band coverage (144-148 MHz). It has the largest digital readout in its class, and the 800 channel

coverage with PLL frequency synthesizer provides you with all existing and proposed Australian repeaters. A convenient front panel switch offsets the transmit frequency up or down 600 kHz.

WHENEVER YOU WANT TO MOVE UP — KENWOOD HAS THE WAY



TR-2200 2-metre VHF
FM portable receiver



R-300 all band or ham
band communications
receiver



The new
TS-520S HF transceiver
— Ideal for the novice



TS-700 2-metre VHF all
mode transceiver

Your nearest Kenwood dealer will be happy to give you more information on the entire Kenwood range of amateur radio products including the remarkable new TR-7400. Contact him direct or write to us at Weston Electronics.



KENWOOD

Marketed in Australia by
Weston Electronics Company,
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Distributors for The Kenwood
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SUPPLY ME

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WITH MORE INFORMATION

PEC-ART-2

VHF-UHF AN EXPANDING WORLD

Eric Jamieson, VK5LP

Forrester, 5233

AMATEUR RADIO STATIONS

VK0	VK0MA, Mawson	63,790
VK1	VK1RTA, Canberra	144,475
VK2	VK2WV, Sydney	62,450
	VK2WV, Sydney	144,018
	VK2RHR, Milongga	144,120
VK3	VK3RTG, Vermont	144,700
VK4	VK4RTT, Mt. Snowdon	144,400
	VK4RBB, Brisbane	432,600
VK5	VK5VF, Mt. Lofly	83,000
	VK5VF, Mt. Lofly	144,880
VK6	VK6RTV, Perth	62,300
	VK6RTU, Kalgoorlie	62,350
	VK6RTW, Albany	144,500
	VK6RTV, Perth	144,500
VK7	VK7RNT, Launceston	62,490
	VK7RTX, Lonsdale	144,800
	VK7RTX, Lonsdale	432,475
VK8	VK8VF, Mt. Lofly	83,000
K08	K08JQX, Guam	50,110
KH6	KH6RDI, Hawaii	50,104
ZL1	ZL1VHF, Auckland	145,100
	ZL1VHF, Waikato	145,150
ZL3	ZL3VHF, Upper Hutt	20,770
	ZL3VHF, Manawatu	21,600
	ZL3VHF, Wellington	145,290
ZL4	ZL4VHF, Christchurch	145,290
ZL4	ZL4VHF, Dunedin	145,490

Graham VK8CJ writes from Darwin advising the beacon VK8VF is now operating 100 per cent. He goes on with news of happenings in that area, mainly the six metre scene with openings to Japan as follows:

3/7/77 0815 to 0850Z JA1 and JA9, six stations.
10/8 1002 to 1003Z JA1TTS
6/9 1148 to 1240Z JA1, JA2 and JA4, five stations.
5/9 1250Z JA6UWK.
11/8 1136 to 1210Z JA1 JA2 and JA3, 15 stations.
11/8 0710 to 0755Z JA1, JA2, JA3 and JA4, 16 stations.

* A couple of interesting things to note were that JA1TTS worked into W6 on 12/7/77 and claimed this to be a sporadic E. This being so, five hops would be involved. For me to work V56, JA and ZL I take three hops and that is quite rare (my contacts to V56BE were by Es). So we hope Es is really something! Tai advised me this year he has worked KG6, KL7, JDI, VK, DU V56 and W6, which is really great.

* KC2PO was operational last week from the Caroline Islands. The DXpedition was worked in JA on 11/9, nothing heard in Canada.
* On 11/9 I was working "AZBY" who was copying W6SJD/DUG and I ran a test with the station in DUG at the request of Yoshi. Nothing heard. Yoshi played back a tape of the station. We were all on 52040 at the time.

Also on 11/9 R1AUW asked for a test on two metres. We arranged it for 1200Z but nothing heard. Six metres was not open at that time although for the three previous evenings it had been. Frequency was 144.100 MHz. There appears to be quite a bit of interest in JA about working VK on 144.

* Finally, Flash VK6FN in Derby is now on 2 metres with about 100 watts to a 16 element yagi. * Thanks for the news, Graham, it's good to hear someone is keeping interest alive on six metres from VK for the benefit of overseas countries. So we hope Es is really something! Tai advised me this year he has worked KG6, KL7, JDI, VK, DU V56 and W6, which is really great.

I was also pleased to receive a letter from Fred VK2BJF, who lives in Kilarney Vale, and who previously held the call of G3W5. For some years before coming to Australia Fred was very active on 2 metres in the UK, working a total of 14 countries in Europe in the period 1952 to 1959. Since moving to VK I find he has continued himself mainly to HF operation.

However as with all good VHF oriented amateurs he felt something lacking, and has

decided to start operating on 2 metres again. A 15702A now has a good position at the operating table, and outside a 5/8 wavelength vertical for local contacts and a 10 element yagi for the DX contacts, and will look at the need for a 100 watt linear if the need arises.

We welcome you to the band, Fred, and hope you will have some enjoyable contacts, although operating is somewhat different here from the UK in that we have no close countries to work, even New Zealand is a rather elusive 2 metre contact. Good luck and always pleased to hear from you.

SIX METRES

It looks as though my thoughts on trying to regain all or portion of the 50 to 54 MHz band has not fallen on deaf ears or blind eyes. This month I have received some very interesting mail from readers, each one contributing their thoughts on the proposals outlined in the September issue of AR. There have been some extremely good suggestions made, and all will be carefully noted on the day of reckoning.

I am pleased to acknowledge correspondence on the matter from the following: Ron VK2ATO, Geoff VK3AMK, Stephen VK3VEZ, Peter VK3ZYQ, Keith VK4KX, Keith VK4AKT, Allan VK4ZBB, Greg VK8RA, Joe VK7JG and Graham VK8CJ. In addition Mike VK3SV and David VK5KH have both supported the proposal in discussion on these pages. That makes ten letters so far, I would hope to receive at least another 100 in the next month or so. Why not write now and give me your views on the proposals? There have been a few side issues come to light in the present letters and points worth noting. At this stage I see no need to mention them as I would like to have the spontaneous presentation of your thoughts on the pros and cons of the matter without feeding you information.

I said before, and I'll say it again, if I take up something which I believe worthwhile, I will leave no stones unturned in an effort to get somewhere, but I do need the support of the VHF fraternity. Last year I worked more than 100 different stations on six metres alone, and I would expect to get some correspondence from all of you. I want your thoughts in writing, not only on the air, but certainly discuss it on the air, then write. And this applies equally to VK5 operators too, stop being lazy and half-hearted, just because I live in VK5 doesn't give you any more privileges, or to rest on your laurels, whatever you rest upon! Get cracking you locals, too.

GENERAL NEWS

From amongst the many pages of correspondence received on the matter of the 6 metre band allocation some have included various items of general interest and the following have been selected from those pages, with acknowledgements as shown.

Ron VK2ATO supports the suggestion in a memorial to Ron Wilkinson VK3AKC to be in the form of a trophy awarded each year to the operator who has made the outstanding contribution to VHF-UHF. What do the rest of you think?

Peter VK3ZYQ remarks he had a great time on 6 metres last year, despite Channel 0, and worked VK2, 3, 4, 5, 6, 8 and P29 using 250 mW PEP output to a 4 element yagi. Great difficulty getting through all times when strong stations are around, but great fun! That's a fine spirit, Peter.

Joe VK7JG mentions in Tasmania they have a translator operating on Channel 0, which covers a limited service area and presents very little problem.

Keith VK4KX writes "An incentive to work ZS on six metres with today's 'super-gear' I heard ZS1ET on MCW on 50.02 approximately on Tuesday, 14th January, 1948, 1700 to 1756 EAST R7 on peaks, with much QSB. It was apparently a beacon station identifying every 20 seconds. VK3, 5 and 6 were also in at the time. Weather patterns similar to present season. Rx 522 (original) to 4 element yagi, 20 foot high." That's a bit of a pity, as I have been waiting for it. I wonder if anyone else heard the station?

Geoff VK3AMK advises having received a report of W6GZ being anxious to work VK stations on 6 metres, and has been hearing signals on Channel 0 frequency.

MOONBOUNCE REPORT

From "The Propagator" Lyle VK2ALU reports that repairs were made to the dish surface and the main part of the Clavin feed was made up and installed. Initial tests showed a small improvement in gain, but the required impedance matching arrangements has yet to be installed to give the best SWR.

An EME test on 2/8/77 was scheduled with SM5BFX who was not heard, and FT2U who was contacted with "M" report both ways.

Further damage has been caused to the moonbounce site buildings by vandals but essential equipment has not been damaged.

VHF/UHF FIELD DAY

From the New Zealanders who are going ahead with their annual Field Day on Saturday 3/12, and Sunday, 4/12, and will be operating on Saturday night 4-5 Sunday morning local time.

The VKs have tried to hold a Field Day Contest on the first week-end in December for several years with not a lot of success, especially when it comes to having logs returned. However, there does not seem to be any need to drop the idea and so what about the following suggestions being followed this year for a round Australia VHF Field Day?

1. Base the operation on the rules and regulations for the 1974/75 Ross Hull Contest, including scoring on the distance scale.
2. Cross band contacts permitted with points being claimed for those contacts to the higher frequency band of the contact concerned.
3. Contacts with the same stations permitted at not less than two hour intervals for band to band or cross band contacts as the case may be.
4. Field Day stations to be powered from a source other than AC mains. Operate on from a vehicle permitted provided it is stationary. Contacts through repeaters not to be included in scoring.
5. Base stations are invited to work field day stations and to exchange numbers in the usual way.
6. Fill out your log book in the usual way showing the contest numbers exchanged, add in the points score and approximate mileage, then have your photo-copied. This will save the need for hand copying on to contest pages. Most people have access to a photo-copier in their home.
7. Include the usual front sheet as per Ross Hull rules, and forward to VK5LP by the end of January 1978. There will be a trophy for the winning entrant.

8. The aim of the field day is to assess whether there is enough overall interest to have a try at making it an annual event. By using the Ross Hull rules for 1974/75, which were published in the AR, instead of the current rules there is some incentive to take out equipment for more than one band. The cross band operation helps you to keep active during the day and keeps you on your toes. Try it!

9. Operating hours to be from 0730Z on Saturday, 3/12/77, to 0730Z on Sunday, 4/12/77, for the 6 metre band section, and for those unable to operate for 24 hours any two three hour continuous periods, e.g. from 0800 to 1100Z on 3/12 and 1900 to 2200Z. This makes a total of six hours. You may also operate for any one period of six continuous hours if you so choose. You front sheet should show the operating hours and the points scored for those periods. Separate trophy for the six hour section.

10. These are a set of hastily drawn up rules anyway. If you are not sure about any points too your own sensible judgement and interpretation of what you believe would have been required. Even if you cannot go out to a field day site, why not come on and give those who do some contacts? With the possibility of some stations at good sites in different areas of Australia it might be surprising how far contacts can be made, particularly on 2 metres, and it will be the right time of the year for them too.

That's about all for this month, things have been a bit of a case on the air, and I have been rather busy so probably have missed a few things. Concluding with the thought for the month "Most ignorance is vicarious ignorance. We don't know because we don't want to know."

73. The Voice in the Hills.

AROUND THE TRADE

LOW COST SURVEILLANCE RECEIVER

The Walters-Johnson Company, who specialise in defence communications equipment, has now produced a modestly priced general purpose HF receiver which is ideal for surveillance work.

Identified as the Model WJ-5718, it is designed to be used in either a manual mode or with remote digital frequency control. It is capable of detecting AM, FM, CW, ISB, LSB and USB transmissions (A1, A2, A3a, A3b, A3c, A4, F1, F2, F3 and F4) over the frequency range.

Using the building block approach, certain features are available as options to increase the capabilities of the receiver. The mainframe provides the following:

- 5 kHz to 30 MHz Frequency Coverage.
- Seven Selectable IF Bandwidths from .3 to 16 kHz (including the ISB option)
- Seven-digit Green LED Frequency Display
- AM, FM, and CW Detection Modes.
- Low Phase Noise Frequency Synthesizers.
- 10 Hz Tuning Steps
- Tunable Synthesized BFO (± 8 kHz).
- Audio Level/Signal Strength Meter.

Options include the following:

- Remote Control Module (RCM)
- Manual Control Module (MCM)
- ISB Module (ISB)
- Sub-Octave Prescaler Module (PRE).
- 10 kHz BFO Synthesizer Resolution (B10).

Tuning range of the WJ-5718 is 5 kHz to 29.99999 MHz with a tuning resolution of 10 Hz. Frequency display is by 7 digit green LEDs.

Full technical specifications are available from R. H. Cunningham Pty. Ltd., phone (03) 329 9633. ■

SENNEHEIMER INFRA-RED SOUND

Senneheimer Electronics of Hanover, West Germany, and its partner in Australia for over twenty years, R. H. Cunningham Pty. Ltd., announces the introduction into Australia of Infra-Red sound. It will be known commercially as SENNEHEIMER INFRA-PORT. It is claimed to be the only m.c. or innovation in high fidelity sound since the introduction of the "compact cassette" some thirteen years ago.



The m.c. or attraction to the SENNEHEIMER INFRA-PORT system is that an m.c. signal may be relayed through headphones without any cables, wires or leads to get in the way or obstruct any movement. Models are available in both mono-phonetic and stereophonic versions. ■

DICK SMITH RETAIL STORE OPENS

AT PARRAMATTA

Dick Smith Electronics opened their sixth store at Parramatta on August 1st, 1977.

The new store, situated in Perkins House, 30 Grose Street, is the sixth in a growing chain of "Electronics for the Enthusiast Stores"—Grose Street runs parallel with Victoria Road, north of Parramatta.

The first store at Gore Hill opened nine years ago and since that date, Dick has opened stores in the City (York Street, Sydney), Bankstown, N.S.W., Brisbane and Melbourne. The Manager of Parramatta is Bill Edge who formerly managed his own electronics business in Sydney, called Edge Electrics.

Dick expects the Parramatta store to grow with the Parramatta area, which is a major shopping centre. ■

LARA

Ladies Amateur Radio Association

In this month's article we have news of YLs from all over the place.

Susan VK2BSB, after an absence of some years, is suddenly bursting with enthusiasm for amateur radio. She has started a new radio club, the Liverpool and Districts Radio Club. No doubt she will be pleased to hear from any interested amateurs living near Liverpool.

Two New Zealand YLs have joined the DX-ception to the Parmadeck Island Group near Auckland. They are Marilyn Lister ZL1BKL and Carol Johnston ZL1AJL. They are at Raoul Island, which is the largest of the group and the only populated one. The population of ten operates the

meteorological station on the island. The whole island group is a flora and fauna reserve and the DX-ception party had to obtain special permission from the New Zealand Government.

Speaking of New Zealand, Mavis VK3KS won 8th place in the recent WARO competition. She was the only DX YL to compete, and special mention was made of this fact. Unfortunately she was referred to as VK3KB.

Lorraine, wife of VK6BV, should by now be admiring the new quad in the back yard. The last one was destroyed during the Kalgoorlie earthquake.

One of the newest licensed YLs in New South Wales is Elizabeth VK2BIX. Elzabeth also holds a commercial operator's licence.

One of the latest Victorian licensees is our very own publicity officer, Heather VK3KMF. Heather is working steadily towards the full call.

In the 1977 Call Book 32 licensed YLs and 26 YL shortwave listeners are listed.

In next month's AR we will be starting a series on semi-licensed Australian licensed YLs.

33's from LARA.

Heather Mitchell 3NFX, Publicity Officer. ■

QSP

GRP

An article by KREEG in June '77 QO mentions the "almost impossible" challenge of working 100 countries with less than 5 watts output. It had not been done before but now five stations have qualified. The harder DXCC Milliwatt Award (1 watt power output) has not yet been achieved, says the article.

HAMADS

- Eight lists free to all WIA members \$8 per 3 cm for non-members.
- Copy in typescript please or in block letters to P.O. Box 150, Tororik, VIC 3142.
- Commercial advertising is excluded. Repeats may be charged at full rates.
- Closing date, 1st day of the month preceding publication. Cancellations received after about 12th of the month cannot be processed.
- QTHR means the advertiser's name, and address are correct in the current WIA Radio Amateurs Call Book (note for October AR only—because of delays in processing, the 1975 Call Book refers).

FOR SALE

DC-260 Yaesu Mobile Power Supply for FT260, complete with plugs and cable, very good condition, \$60. Mark mobile helical whips, 100-60, 100-40, HW-20, 150 each. VK3KXE, QTHR. Ph. (03) 45 1861.

201d1 Corec again available. Build that balun or antenna coupling unit now. Corec similar to p. 581 of 1977 ARRL Handbook. Handle legal power 3-30 MHz, 37.55 ea., plus postage VK3AGF, QTHR Ph. (03) 379 6624.

YAESU FT8X 431 10/60m, matching speaker, mic, cooling fan, excellent CW filter and effective noise blanker. Instruction manual Price \$400. Also Multi 7 2m, excellent performer, 13 sets of crystals, 1170 VK2AAC QTHR. Ph. (02) 521 7080

Ideal QX location at foot of Mt. William. Using old country church intended for conversion to weekend, easy access to Gramplanins, Ararat and Great Western, 200 km Melbourne, partly furnished, electric stove and refig. electricity and water. Owner transferred interstate, \$5,000 VK308, QTHR. Ph. (03) 560 2804

Seam 350 Transceiver with AC power supply, good condition, \$350 VK4WB, QTHR.

Grolier Australian Encyclopedia's (9 volumes plus 1 index), never used, gift duplicated, \$50. VK2AMA, QTHR. Ph. (03) 69 6636

Atlas AC Power Console for Atlas 210K, etc. In excellent condition, also complete set of ASAH! AS303A mobile centre loaded whips for 80 to 10m. VK4XT, QTHR, or write to Box 496, Dalby. Ph. (074) 62 2389.

Lafayette HA-600A all band RX, excellent condition 2 speakers headphones, complete with manual and battery cable \$150 or QND. A Harrison, Nilma. Ph. (054) 23 2450.

Igohube FM116-16LA 12 channel 2m FM Transceiver, complete with commercial 5/8 whip \$120 or QND. VK2BNL, QTHR. Ph. (02) 48 1263.

Ken KP202 Q/W ch. 2, 4, 6, 8, Simplex 40 and 50, Nicads, and Ken charger, original condition, \$145. Siewa 29/2 watt C/W ch. 2, 4, 6, 8, Simplex 40, 50, 51, excellent condition, \$160. Will exchange for good general coverage comm. Rx. Ray Price VK3AWQ Ph. (058) 74 1351

Brand new Atlas 210X solid state SSB Transceiver with noise blanker, Atlas 240V deluxe AC console speaker, Atlas deluxe mobile mount Atlas 10X 10 ch. dual oscillator Shure 404C mike, pair, antiser helical mobile antennas for 80 40 20m, with mobile base, all equipment brand new in factory sealed cartons, \$1,250. Also brand new Winton WE-800 2m FM portable synthesised radio, switchable 1 and 12W output, complete with nicad batteries, frequency range 144-148 MHz in 5 kHz steps. Five pre-set channels, \$399. James Goodger VK210. Ph. (02) 36 2961

Monica Ford Vm Transceiver, converted SBE sideband, 23 ch. CB, new: normal PEP out 23W, \$235. VK3BDM QTHR Ph. (03) 48 4083 A.M. (03) 48 5140 Bus.

Field Strength Meter for ham or CB use, \$9. Joyalick antenna, 150 to 30 MHz C/W type 5 and 3 type 3 AT12. \$25. Wodec UM1 modulation transformer 3L, HF and VHF tubes, all new or as new, 6XQV6 or 20A \$10 ea. 6XQV6-40, \$12 6XQV-7, \$3 ea. 2E28, \$4, 5753, \$3 ea., 5B/254M \$5 ea. or 5B par. 1C81 at \$3 ea., 6F95 6F91/277 at \$2 ea., power transistors, types 2N1490 and 2N1514. Ideas for high current LV regulated power supplies, \$5 ea. Eddystone split stator variable capacitors type 583 super 18 x 18 pf or 25 x 25 pf, \$3 ea. Collaro high fidelity crystal microphone, hand type, \$10, fundamental freq. 87G type xials, all new in following frequencies 7027, 7066, 7088 MHz, \$5 ea., harmonic frequency types, also new, 10533, 11750, 14065, 15020, 21777, 32520 34035. Micro at \$4 ea. VK2BFC, QTHR Ph. (043) 32 5758 any time

Teleprinter Model 15, brand new, complete, \$70 VK3ZY, QTHR Ph. (03) 277 4748 A.M. \$30 5961 Bus.

FT200 with full 10m crystals, power supply, speaker and mic, \$295, TSS20, used only Jan. to Apr. 1977, \$370 VK2BM, QTHR Ph. (02) 771 1657 A.H.

Yaesu FT101 160-10m, plus 5P101 and mic, Yaesu PLR2100 linear Heathkit HQ10 monitor scope, Trio PR98D00 Gen. 550-300 MHz Trio mic MR50 plus stand valves 5728 5456 mobile neck antenna and mount. Must sell all gear, best offers. VK2BSP, 7 Amerco Ave., Wahroonga Ph. (02) 425 8624.

Galaxy III, 90-40-20m Transceiver, 440W input, with matching AC power supply/sprk and DC power supply, with manual, new spare film tubes and mobile mount \$350 VK6EO, QTHR Ph. (097) 52 1172.

VHF Gear: FTV-650 6m transceiver, "FTV-250" 2m transceiver, switching box providing for mono/crossband operation with up to 16 channels, plus 10m HF, 3 spare FTV-650 cases and meters, Mike, Yaesu parts, \$350 the set. FM 2m mobile, Inoue IG20 with 4 current xils, \$115 Oscar array comprising 2 of 29 MHz yagi, 1 of 148 MHz PLPA, magis. AR22H rotor, control unit and control unit, \$100. VK3ACV, QTHR Ph. (03) 567 6612 (bus.) (03) 787 5426 (AH).

FT200 Transceiver with power supply, handbook and complete set spare valves, \$350 VK2ABB, QTHR Ph. (02) 520 0886

Lafayette PI85A VHF R/T Tunes 144-174 MHz FM, plus 2 xil channels, includes inbuilt A/C power supply, speaker, mobile cradle, dial lamp, mutes, cables and hardware. As new or buy for \$75. Ph. (02) 487 2131 bus. or (02) 460 7973 (AH).

Collins 800 kHz Mech. Filters, 1 set, 8/100 MHz, 5-1 xrt and 6.0 xrt, sell \$50 or swap for 800 kHz SSB filter plus 1 or 2 carar xils, also 1 Collins 468 kHz mech. filter for CW, \$15. VK2YOV, QTHR Ph. (007) 52 1185

Bisal Tower, 86 ft free standing, 4 sections, fitted with heavy duty prop-pitch rotor and indicator unit and TTX2000 100W output, 100W, 100W, 100W, transported and erected, \$450 ONO. VK3BAJ, Ph. (03) 874 5554 bus.

KW Viceroy Mark IIa Tlx 10-90m, \$375; Hal Icarites SX117 R/T Triple Conv xil 90-150m for 160m (plus 160 conv) 80-40-20-15-10m. Up to 29 MHz 10 MHz VVVV and provision for 5 further 500 kHz segments in range 7.35 MHz to 30 MHz. \$300. 58200 10-50m linear set, 58278 in final, \$400. 2X100 Tlx 160-10m CW rig, includes hefty (2 kW) 117/224 tranny, 770, VK6HD, QTHR.

Rotators Hm 1, \$125; Alliance UDO 115 vhf, Ideal VHF or small HF set, \$35 Marconi HF sig. gen 20 kHz-20 MHz, \$175, IG22 crystals, rpt. 1, 3, 4, 5, 6 and 7, simplex \$50, 61 and 147 \$35, 87 and 91, Yaesu YD444 deluxe desk mic, \$30. VKCOM, QTHR Ph. (03) 560 9215.

Power Supply 230V/40/80 Hz input, 325W at 30/80 mA DC out, essential circuitry, primary and secondary fused, mains xmr oil filled, size of PB is 12 x 7 in x 6 1/2 in, no case, \$25, Woden UML modulation xmr, \$70, low voltage bench power supply 6 to 15V DC ad adjustable output, 80 mA, 5/0, protected, \$15, VHF VHF QGV3-20A, \$10 each, QGV05-40, \$12, QGV6-30 (146) \$5; QGV4-7, \$3 M/C meters 2V6 in face 0-20 mA PSD manual by E Turner (UK), \$10 ea. Please add little extra for postage or freight. Ph. (043) 32 5756 any time

Central Electronics Signal Filter (SSB adaptor) Model 1155 with built-in "Q" multiplier. \$150. \$50, Johnson Coltr Linc 1000, plus 811A/C 115V AC - \$95 VK3LS QTHR Ph. (03) 82 2152

Allan 215X Solid State HF SSB Transceiver, brand new with noise blanker, mic and comprehensive lab. report and handbook, guaranteed performance 160-15m, superb receiver ideal mobile rig, price \$750, in superb condition, local new price. VK3VAP Ph. (03) 231 2452

Citizen Dual Time LCD Chronograph Watch with stop watch facility brand new with guarantee, gold, spare battery accuracy within 5 secs per month, ideal watch for the Dxer, suitable for any additional time zone. Price \$150 ONO. VK3VAP Ph. (03) 231 2452

Brand new New-Tronics Hustler 4-BTV vertical trap antenna giving 70-140 metre coverage. Never used as miniband to take its place. Separate settings for phone and CW not necessary. Radiote efficiency greater than other trap verticals. \$100 ONO. Ken VK6EA, Box 768, Carnarvon 6791 Ph. (093) 41 1001

MILITARY

LINDSAY H (TUBBY) VALE VK6SDO
With the sudden death of "Tubby" Vale VK6SDO on October 1st, 1977, Australia and the world lost one of its foremost Amateurs and Contest Operators.

First licensed in the early 30s as VK3KRE, Tubby worked with Electronics the whole of his life, as well as making it his hobby. Many of today's moderns can look back to the help and encouragement given them by SMO when studying for their ADCP. Right up to the time of his death he conducted slow code practice sessions for beginners.

His quest for further knowledge took him to various parts of Australia and England, with short periods in both France and Belgium and as well as the two call-signs previously mentioned he also operated VK2ZLU, 2XMR, MKO and G call.

Although lacking in academic qualifications, Tubby was able, by sheer knowledge and ability to push his way to the fore in his sphere. He relinquished his job as Chief Electronics Engineer with De Havilland (Australia) to take up the position as Manager of the ELDO Satellite Tracking Station at Cove in the Northern Territory. It was while he was there that the heart condition that led to his death, first manifested itself.

Everyone who worked an RD Contest will remember the outstanding scores made by SMO. This was despite the fact that he never used a transceiver, always repaired pieces of equipment which he made himself. Only a few months ago he obtained the international title to transceive. The first and only time he ever bought any ready made gear — and was looking forward to using it in the CW Section of the VK-ZL Contest this year. It was in CW contest operation that Tubby started and he won awards from all the amateur countries of the world. The electronic keys that he designed and built are well known wherever he used.

I first worked Tubby on Dec. 26th 1937; and shortly after that date we set up weekly sheds which, other than war years and when he was abroad (than we wrote), we kept up to the time of his death. The last shed was just an hour or so before he died, when he told me of a new VLF filter he had developed. These sheds became well known and many others joined in over the years and I know that several SWI's became Amateurs because of listening to them.

I and many others, will always remember him for his saying when faced by a problem: "There must be an easier way of doing this".

FTV-650 6 metre Transceiver in as new condition with handbook, \$150. VK2VUL, 45 Blume Ave., Griffith Ph. (089) 82 4037 A.H.

WANTED

Kleinschmidt Teletypewriter TT-119 or similar, any condition. Also Kleinschmidt series governed motor ED Penikis VK1VP, QTHR.

Mini II 7m Transceiver, complete with repeater xil, in going order or not, or repeater xils 1-8 suit any suit (optional) Ring Gek VK2ACT, Ph. (093) 42 1382 with prices.

Information/Circuit/Handbook BC 348m Rix and PS for school electronics group, suit supporting tower to 50 ft. In the sections, Hunter Valley area. Quote to VK2BLP, Warners Bay High

Linear Amp, 10-100, good condition; VLF receiver down to about 14 MHz. Details and price to VK6ED.

Linear Amplifier for HF bands, commercial unit preferred. Particulars to VK3VFP, QTHR. Ph. (03) 95 5527

Kyokato Synch. 2 Mx Transceiver, VK3AFW, QTHR.

SILENT KEYS

It is with deep regret that we record the passing of —

**Mr. M. P. MARCHALL VK3MM
Mr. J. MARSLAND VK3MY
Mr. L. H. VALE VK3NO
Mr. R. M. MUTTON**

All amateurs would like to extend their deepest sympathy to his wife Joyce, who has had a harrowing time over the last few years because she knew that Tubby could go at any minute's, daughters Stephanie and Joanne and son Jeff VK3BHC.

73 Tubby Sk de VK3AHM Jeff

JIM MARSLAND VK3MY
It is with great sorrow we record the passing of Jim Marsland VK3MY, on the 28th September, 1977.

Jim was licensed in 1931 and three months later moved to Camperdown where he actively communicated and experimented on the 3.5 and 7 Mhz bands and on the then very popular 200 metre broadcast band.

At a later date he moved back to Melbourne and was an active member of the Victorian Division of the Wireless Institute of Australia. Prior to World War II he was a member of the RAAF Wireless Reserve from which the Combined Services drew so many well trained operators.

In 1933 Jim was appointed to the Amateur Radio magazine committee to which he devoted tremendous energy, particularly during World War II when the magazine was produced on rationed paper supplies and took the form of a resealed publication. He continued this work until 1960.

In 1935 he was appointed Treasurer of the Victorian Division of the WIA which post he held until 1946. He carried out his arduous task in addition to the continuous work of the Magazine Committee. The continued success of the WIA Victorian Division and of the official WIA magazine was in no small part attributable to his interest and energy of Jim. His land who gave ungrudgingly of his time in an honorary capacity.

Like all amateurs, he contributed his part to the vast world-wide network of amateur radio operators who have done so much for the progress of communications and whose international goodwill has bridged the boundaries of race, colour and creed in a manner unsurpassed by mankind in other walks of life.

The fraternalism of amateur radio operators is a source of his passing and extend sympathy to the bereaved family of VK3NY.

Licensed Amateur (full call) for private tutoring a student going for licence. Prefer local person. Fee negotiable (theory only). Ph. (03) 97 8631 (Moorabbin).

Mini-Products Hybrid Quad Antenna, 3-10-15-20m. Details and price to Ken VK6ZA, Box 768, Carnarvon 6791 Ph. (093) 41 1001

Forest Phone, 2 liner converted or suitable for conversion to 160m. Please write John Davies VK3BJE, P.O. Box 165, Greensborough 3088. Ph. (03) 455 4269

Bottom mast clamp for EMOTATOR beam "cable" Model 130M or rotor complete with bottom mast clamp VK3LS, QTHR Ph. (03) 82 2152.

German WW II Military Morse Telegraph Key. Preferably in going order. VK3KG, Box 5, Clayton, Vic. 3182. Ph. (03) 644 4108.

FT101 Transceiver, prefer early model to about 1400 Parts to VK3QD QTHR. Ph. (03) 566 9215
Antenna tower Hy-Gain "Hy-Tower" model 18HT, 90m to 120m vertical VK2BZF, QTHR. Ph. (043) 32 5758 any time

FT200 or similar tcr, unmodified, will pay up to \$400. VK3NCP, QTHR

**DRAKE**

C-Line Amateur Equipment

**\$795**

Drake R-4C

Solid State Linear permeability-tuned VFO with 1 kHz dial divisions. Gear driven dual circular dials. High mechanical, electrical and temperature stability.

Covers ham bands with crystals furnished. Covers a l of 80, 40, 20 and 15 meters, and 28.5-29.0 MHz of 10 meters.

Covers 160 meters with accessory crystal. In addition to the ham bands, tunes any fifteen 500 kHz ranges between 1.5 and 30 MHz, 5.0 to 6.0 MHz not recommended. Can be used for MARS, WWV, CB, Marine and Shortwave broadcasts.

Superior selectivity. 2.4 kHz 8-pole filter provided in sst positions. 8.0 kHz 6-pole selectivity for a-m. Optional 8-pole filters of 25, 5, 1.5 and 6.0 kHz bandwidths available.

Tunable notch filter attenuates carriers within passband.

Smooth and precise passband tuning.

Transceive capability may be used to transceive with the T-4X, T-4XB or T-4XC Transmitters. Illuminated dial shows which PTO is in use.

Lsb, tss, a-m and cw on all bands. Agc with fast attack and two release times for sst and a-m or fast release for break-in cw. Agc also may be switched off.

New high efficiency accessory noise blander that operates in all modes.

Crystal lattice filter in first i-f prevents cross-modulation and desensitization due to strong adjacent channel signals.

Excellent overload and intermodulation characteristics.

25 kHz Calibrator permits working closer to band edges and segments.

Scratch resistant epoxy paint finish.

**\$47**

Drake MS-4

Drake MS-4 Matching Speaker (for use with R-4, R-4A, R-4B and R-4C Receivers. (Has space to house AC-3 and AC-4 Power Supplies).

**\$695**

Drake T-4XC

Solid State Linear permeability-tuned VFO with 1 kHz dial divisions. Gear driven dual circular dials. High mechanical, electrical and temperature stability.

Covers ham bands with crystals furnished. Covers all of 80, 40, 20 and 15 meters, and 28.5-29.0 MHz of 10 meters.

Covers 160 meters with accessory crystal. Four 500 kHz ranges in addition to the ham bands plus one fixed-frequency range can be switch-selected from the front panel.

Two 8-pole crystal lattice filters for sideband selection.

Transceives with the R-4, R-4A, R-4B, R-4C and SPR-4 Receivers. Switch on the T-4XC selects frequency control by receiver or transmitter PTO or independently. Illuminated dial shows which PTO is in use.

Usb, lsb, a-m and cw on all bands.

Controlled-carrier modulation for a-m is compatible with sst linear amplifiers.

Automatic transmit-receive switching. Separate VOX time-delay adjustments for phone and cw. VOX gain is independent of microphone gain. Choice of VOX or PTT. VOX can be disabled by front panel switch.

Adjustable pi network output.

Transmitting agc prevents flat-topping. Meter reads relative output or plate current with switch on load control.

Built-in cw sidetone.

Spotting function for easy zero-beating.

Easily adaptable to RTTY, either fsk or a-fsk.

Compact size, rugged construction. Scratch resistant epoxy paint finish.

High Pass Filters for TV Sets

provide more than 40 dB attenuation at 52 MHz and lower. Protect the TV set from amateur transmitters 6-160 meters.



Drake TV-300-HP

For 300 ohm twin lead \$13



Drake TV-75-HP

For 75 ohm TV coaxial cable, TV type connectors installed \$17

**\$165**

MN-4 (Model No. 1507)

**\$310**

MN-2000 (Model No. 1509)

Drake MN-4 & MN-2000 Matching Networks

• **Integral Wattmeter** reads forward power in watts and VSWR directly, can be calibrated to read reflected power. • **Matches 50 ohm transmitter output** to coax antenna leadline with VSWR of at least 5:1. • **Covers ham bands 80 thru 10 meters**. • **Switches in or out** with front panel switch • **Size** 5 1/2" H, 10 1/2" W, 8" D (14 0 x 27 3 x 20 3 cm). MN-2000 14 1/2" D (36 8 cm). • **Continuous Duty Output** MN-4 200 watts MN-2000, 1000 watts (2000 watts PEP) • MN-2000 only up to 3 antenna connectors selected by front panel switch.

TVI Filters

NEW SHIPMENT — JUST ARRIVED
Low Pass Filters for Transmitters

have four pi sections for sharp cut off below channel 2, and to attenuate transmitter harmonics falling in any TV channel and fm band. 52 ohm. SO-239 connectors built in.

Drake TV-3300-LP

1000 watts max. below 30 MHz. Attenuation better than 80 dB above 41 MHz. Helps TV-I interference, as well as TV front-end problems. \$32



Drake TV-5200-LP

200 watts to 52 MHz, ideal for six meters. For operation below six meters, use TV-3300-LP or TV-42-LP \$32



Drake TV-42-LP

is a four section filter designed with 43.2 MHz cut-off and extremely high attenuation in all TV channels for transmitters operating at 30 MHz and lower. Rated 100 watts input. \$19



Prices shown include Tax

Write, phone or call for technical information

P.O. Box 30, Concord, N.S.W. 2137.
Telephone: 736-2888.
Melbourne P.O. Box 107, Mt. Waverley, Vic 3149.
Telephone: 233-4044.
Adelaide 42-6666; Brisbane 392 2884.
Perth 25-3144.

ELMEASCO**Instruments Pty. Ltd.**

VICOM

VALUE IN COMMUNICATION

Think hard before you buy. Then buy ICOM the quality name in VHF/UHF amateur radio equipment.

VICOM provides a thorough pre-delivery check, a full 90 day warranty supported by technical expertise and well equipped workshops, and a complete stock of spare parts.



IC202

The IC202 is the 2nd portable which puts communication in your hand with 3 watts pep SSB and CW, true IF noise blanker VFO tuning, and provision for external power and antenna connections. Comes complete with mic, carry strap, dry cells, plug-in, English manual, and VICOM 90 day warranty.

The new IC211 from VICOM is the last word in digital 2m, all-mode transceiver. Fully synthesised in 100Hz or 5KHz steps, has dual tracking, optical coupled VFOs with 7 digit LED readout. One knob controls all frequencies. Model fm, ssb, cw, dx, CW. Internal 240vac and 13.8vdc power supply. Comes complete with VICOM 90 day warranty.



IC225 2m fm synthesised with program memory. ICOM quality with back-up technique support.



IC245

VICOM brings the VFO revolution to you with the IC245 mobile 144 thru 148MHz transceiver. The IC245 features accurate tuning over 90 digital steps, digital display in 5KHz steps, modes fm, ssb (with optional adapter only) and cw. Carrier suppression better than 40dB. TX output 15w fm. Comes complete with mic, bracket, manual and VICOM 90 day warranty.

ATLAS 350-XL

The ATLAS 350-XL from VICOM is the new, all solid state SSB transceiver covering 180 thru 10 metres with 350w pep input and with the superb selectivity for which ATLAS is renowned. Plug in options include digital display, auxiliary VFO and aux. very osc. oscillator.

VICOM provides a whole world of communication products complete with the technical backup and support demanded in marketing specialised, sophisticated equipment. Come and see our wide range of transceivers and accessories, and receive the friendly personalised service for which VICOM has become famous.

JUST PART OF OUR EXTENSIVE RANGE

ICOM	TRU-KENWOOD	ANTENNAS	COAXIAL SWITCH
IC202 3m ssb portable transceiver	TS820S incl digital display	ARK-3 rings ranger for 2 metres	CE201 2 position high power, up to 500MHz top quality
190.00	TS820S HF transceiver 160 thru 16 metres	ARK 2 dingo ranger for 2 metres	23.00
IC202 6m ssb portable transceiver	DO-1 digital display for TS820S	Y7 ground yaga 7m 7dB gain	
190.00	DO-5 digital display for TS820S	AG-CA spring mount base for mobile antennas	
IC216 2m fm portable transceiver	VFO D2 VFO option	AS-4K bumper mount assembly	
190.00	DS-1 power supply (DC) for TS-820S	AS2108Y twin 10el 18dB gain beam antenna	
IC225 2m fm synthesised transceiver	YG-885C Xtal filter for TS820S	AS-6M gutter mount	
278.00	YG-3095C Xtal filter for TS820S	Londoner five-eights 2m mobile whip	
IC211 2m digital ssb/fm/rev transceiver	VFO 510 VFO for TS820S	- base for above	
785.00	SP50R520 matching extender	HF VERTICAL ANTENNAS	
IC245 2m digital mobile transceiver - fm	TV 502 2m transceiver	VSX quality 90 thru 10m	
480.00	TV 506 2m transceiver	VSA quality 40 thru 10m	
- ssb attachment for above	TS-600 6m transceiver		
Crystals for IC216/IC225/IC245 (pair) when supplied with IC215	TS-700A 2m all-mode transceiver		
IC202 head	SP5200A 2m fm portable transceiver		
IC202 power supply stand	TR-2200A 2m fm portable transceiver		
IC202 2m fm portable transceiver	TR-3200 70cm fm transceiver		
115.00	TR-3400 2m 25w fm mobile transceiver		
IC202 2m fm portable transceiver	Crystals for TR-2200A (pair)		
57.00	MC50 desk microphone		
IC202 2m fm portable transceiver	MC10 ptt hand mic		
56.00	TR-2200A 2m fm portable transceiver		
UNIDEN	TR-3200 70cm fm transceiver		
2020 MH11 HF transceiver 80 thru 10 metres	TR-3400 2m 25w fm mobile transceiver		
799.00	Crystals for TR-2200A (pair)		
8010 Digital external VFO for above	MC50 desk microphone		
149.00	MC10 ptt hand mic		
8020 External speaker	TR-2200A 2m fm portable transceiver		
49.00	TR-3200 70cm fm transceiver		
ATLAS	TR-3400 2m 25w fm mobile transceiver		
ATLAS MODEL 210X/215X SERIES	Crystals for TR-2200A (pair)		
210X transceiver, solid-state with noise blanker	MC50 desk microphone		
990.00	MC10 ptt hand mic		
215X transceiver, solid-state with noise blanker	TR-2200A 2m fm portable transceiver		
950.00	TR-3200 70cm fm transceiver		
ATLAS MODEL 350X-L SERIES	TR-3400 2m 25w fm mobile transceiver		
350X-L transceiver, solid-state, 140 thru 10 metres	Crystals for TR-2200A (pair)		
1209.00	MC50 desk microphone		
350PS matching AC supply, 240 volt	MC10 ptt hand mic		
285.00	TR-2200A 2m fm portable transceiver		
DG-XL plug-in digital display	TR-3200 70cm fm transceiver		
285.00	TR-3400 2m 25w fm mobile transceiver		

CONDITIONS OF SALE: Prices and specifications subject to change without notice. Prices include sales tax but exclude freight and insurance. All items sent Kwikpak collect or Ansett as directed.

WARNING: The law requires that a licence be held for transmitting equipment. Purchasers will be asked to produce a licence when buying equipment.

HEAD OFFICE & MAIL ORDERS,
139 AUBURN RD, AUBURN, VIC, 3122
Ph: (03) 813.2355, 82.5398

Direction: Russell & Kathy VK3JNT
Peter & D. Williams VK3JIZ

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Bathurst
Dealers in all States and Territories

The Bulletin

NOVEMBER , 1977 ;

W.A. SUPPLEMENT TO "AMATEUR RADIO"

BULLETIN

All material for inclusion in The Bulletin to reach the Editors by Phone, on Air, or mail to Flat 74, 50 Cambridge Street, West Leederville, 6007 before 10th. of each month.

L. A. Ball	VK6AN	814531
J. Blaxendale	VK6JD	
A. Baxter	L6C213	493335

CORRESPONDENCE

All other correspondence should be addressed to :-
Hon Secretary W.I.A. (W.A. Division)
P.O. Box N1002
PERTH
W.A. 6001

GENERAL MEETING

Held on the THIRD Tuesday of each month at 1945 Hours at Science House, 710 Murray Street, WEST PERTH.

COUNCIL MEETING

Held at the QTH of the Secretary, 388 Huntriss Road, Woodlands, on the LAST Tuesday of each month at 1930 Hours.

OBSERVERS WELCOME

NOTICE OF MOTION

FOR JANUARY 1978 SPECIAL MEETING

A SPECIAL GENERAL MEETING has been called for Tuesday 17th. January, 1978 at Science House, 710 Murray Street, West Perth during the Monthly General Meeting to consider the following NOTICES OF MOTION.

(1) That the motion as recorded in the minutes of the General Meeting of 18th. February 1975, amendments to the Constitution which were to be adopted, on the motion of VK6RU seconded by VK6PM be passed to an Annual General Meeting to be adopted, now instead be adopted at a Special General Meeting.

Signed VK6DA VK6NE VK6NK

(2) That the Constitutional Amendments referred to at the meeting of February 18th. 1975 meeting be adopted

Signed VK6DA VK6NE VK6NK

FREE ????? Q.S.L. BUREAU

At several meetings we have heard comment on the fact that our QSL Bureau involves some cost to members. (That is if you consider 5 cents per card an extreme cost.)

Recently a letter in AR from one of our members about having a free QSL Bureau brought forth from the N.S.W. Division the fact that they conducted a FREE Bureau.

Well. Almost free. If you dont want your incoming cards more than once a year, and don't mind cards going overseas when the waiting pile reaches an economical weight to post. If so- then its free.

Othertwise have enough S.A.S.E's with the Bureau to maintain a regular delivery to you, and post the cards to rare countries yourself.

Come to think of it - we are not bad off at 5 cents per card.

#####

HAMADS

FOR SALE

Kw Viceroy Mark 3A Tx 10 - 80 Metres
Pair 6146's in Final

\$340.00

HALLICRAFTERS SX117 Rx. Triple Conversion
xtal calabrator - Xtals for 160 metres (plus 160 M C
converter) 80 - 40 - 20 - 15 - 10, up to 29 MHz.
10 MHz WWV and provision for 5 further 500 KHz.
Segments in range 75 KHz to 30 MHz

\$275.00

SB20C 10 - 80 MHz. Linear Amplifier
2 x 572B in Final

\$400.00

DX100 Tx. 160 - 10 Metres c.w.rig
includes hefty (2KW ??) 117/234 Transformer
\$60.00

VK6HD M. Bazely

WANTED

Members to form a roster for the Sunday morning
W.I.A. (W.A. Division) Broadcast. Each member to
do about 3 weeks at a time. The more members in
the roster the further it will be between sessions.
Apply VK6 Council

WANTED

News , technical and general items of interest for
inclusion in The Bulletin. VHF, ETTY, Repeater
information etc very welcome.

Please forward to Bulletin Editors.

WANTED

Information for the Intruder Watch Co-Ordinator. Any information about any Intruder on any band would be greatly appreciated.

Please forward to Dave VK6WT

#####

CHRISTMAS PARTY 1977

The usual Christmas "get together" will be held at Science House on Tuesday 20th. December 1977 following the normal monthly meeting. Light food and soft drink will be supplied but if you require something harder then B.T.O.

A small charge will be made to cover the costs of the evening as it is the intention of the Council to make the evening as self supporting as possible.

Put this date on you calander and make sure that you inform the XYL (or YL) of the arrangements.

Awards to the winners of the various contests will be made on this evening and also the award to the Amateur of the Year for 1977. It should prove to be a very interesting evening so we hope that everyone will come along and enjoy themselves.

C U THERE

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JAMBOREE ON THE AIR

This has just been completed and so far we have not a great deal of detail on numbers etc. but these will be printed as soon as they become available.

For a change the bands were wide open ,or at least a great deal more open than they have been for a number of years. We have heard that quite a number of contacts were made on 15 and 10 Metres. The skip was just not open to the Eastern States and these were not as numerous as previously.

Amateur TV was used for the first ime and although there were only a couple of stations using this mode it did prove to be very popular and we hope to see more of it in the future.

The RTTY stations were far more numerous this year and once again created a great deal of interest.

We did have one complaint from one Scout who tried all weekend to make a CW contact with one of the Novices. We believe that this lad is sitting for his Novice at the next exam. Alas no suitable stations were heard. Maybe next year we can arrange some slow morse contacts for these lads who are interested. I wonder if any station actually made a CW contact during J.C.T.A.????????????? It must be a few years since we heard CW contacts being made on this weekend.

On behalf of the Scout Association of Australia (W.A. Branch) I would like to thank all Amateurs who assisted with their time and gear over the weekend of J.O.T.A. This was truly appreciated by all members concerned and we look forward to your continued co-operation in future years.

Any comments from any operators would be appreciated by the organisers as it would assist in smoothing things out next year

Unless we recieve some "feedback" it is hard to know just what we must do to make the weekend even more successful. Please forward your comments to J.O.T.A Co-ordinator VK6AN or to the Bulletin.

#####

GARDEN CITY DISPLAY

The display at Garden City Shopping Centre, Booragoon, was a terrific success and sincere thanks must go to the great number of Amateurs who assisted with equipment, displays, setting up the display, manning the display and all the other numerous jobs that have to be done.

It is extremely hard to ascertain just how many people actually attended the display as they were coming and going all morning but the comments recieved were extremely favourable and it appears that everyone was delighted with it. Much interest was shown in the Amateur TV, the RTTY and the "gimiks" sections. The MORSE CODE section proved to be far more popular than had ever been imagined and this appears to be a real must for future displays.

Another display is being considered by our PM man but this will not be until into 1976 to give everyone concerned a chance to get over the last one. To all concerned with this our sincere thanks for a fantastic job and we hope that it has done at least something to put Amateur Radio in the correct light in the eyes of the general public.

#####

C.W. GROUP

We hear ,on the grapevine, that several people are interested in forming a C.W. Group as a social activity. We would like to hear more about it so we could tell you more about it but at this stage all we can suggest is that if you are at all interested that you call in after the Slow Morse Transmissions held each night Monday to Friday on 3555kHz. These normally conclude shortly after 2030 Hours WAST and we are sure that those on net will be able to tell you the full story and let you know what is going on.

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SCOUT WEEK 1976

We are advised , from our Scouting Amateurs, that a full week of Scout activities will be held in September 1976 and they would greatly appreciate the involvement of Amateur Radio in this week . Many activities are planned such as Trips to Kettnest, Bike Hikes, Adventure Camps, Fishing Camps,Picnics, Caveing trips and the all important Gang Show.

We wonder if any Amateur operators would be willing and available to give the Scouts a hand over this week by operating stations at the various points. It could be a lot of fun for them as well as for the scouts , cubs, guides and brownies taking part.

If you feel interested then please do not hesitate to contact Peter VK6HU or Les VK6AN who will put your name on the list and arrange things to suit you.

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